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Including Tactical Aircraft in CFE: Can the U.S. Air Force Accommodate American F-16s Removed from Europe?

a Policy Analysis Exercise by:

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prepared for:

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April 11, 1989

(Revised May 12, 1989)

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The views expressed in this paper are those of this author and do not necessarily reflect the offical views of the United States Government, the Department of Defense, or Harvard University.

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Executive Summary

The CFE talks in Vienna have heightened the expectations of East and West alike about the possibility of large reductions in conventional weapons in Europe. However, what seemed at first to be a settled topic--a focus on ground forces--has been challenged recently by the Soviets. This paper takes the Soviet demand to one possible conclusion--the removal of three wings of F-16s from Europe--and answers the question, "What should the Air Force do with these aircraft?" After studying various alternatives, this writer suggests that the Air Force: (1) put the first wing of aircraft at Nellis, (2) disband the second wing and add the F-16s to the Guard and Reserve, and (3) disband the third wing and use its aircraft to replace the Air Force's aging fleet of F-5s.

The road to these conclusions begins with looking at Soviet demands about including aircraft in CFE. After concluding first, that no agreement to reduce large numbers of Soviet ground forces will be reached unless NATO agrees to eliminate some tactical aircraft, and second, that an agreement can be reached that isn't destabilizing, this study turns to look at what aircraft might be selected for reductions.

Four airplanes would be discussed: the A-10, F-111, F-15, and the F-16. The Soviets are not interested in the A-10, a close air support aircraft. NATO, on the other hand, is unwilling to give up the F-111, since its dual role capability and basing in the U.K. has political significance beyond the weapon's military value. The F-15 is a primarily defensive

aircraft that would become more important in a post-CFE world emphasizing defensive roles. This leaves the F-16, a multi-mission, dual role aircraft important to both NATO and the Warsaw Pact. An added incentive for NATO to reach an F-16 compromise is to solve the problem created by LANTIRN. F-16s equipped with this system must train at night--an unlikely event, given the number of low level flying restrictions placed on military training over Germany. By assuming that Soviet ground force reductions will be of sufficient magnitude to warrant reducing the numbers of F-16s in Europe, this paper moves on to examining what the Air Force could do with the F-16s.

Four options are looked at in this paper. The first entails bringing the F-16 wings back to the United States and stationing them at Nellis AFB Nevada, or one of two bases in Alaska--Eielson or Elmendorf. The next alternative is for the Air Force to disband a wing of F-16s and use the aircraft to add to the strength of the reserves. Third, the Air Force could disband a wing and use the aircraft to (a) replace 62 F-5s or (b) the aging stock of F-4s and A-7s. Finally, and only if an arms control accord would so dictate, the aircraft could be destroyed.

It is assumed that the Air Force prefers option one over option two, and so on... due to geostrategic concerns. It would like to have as large a force structure as possible to meet its world-wide commitments. However, it remains to be determined how many aircraft can be accommodated by the preferred option.

A framework is constructed that helps to answer this

question--by looking at the economic and operational merit of each alternative. Economic effects are calculated by measuring the costs of moving, housing, or dismantling a wing, plus the costs of maintaining minimal capabilities at the base vacated in Europe. Operational effects are determined by observing how well an alternative provides a good training atmosphere for the pilots. This means an environment similar to Europe if possible and the range space to conduct wartime flight maneuvers.

This paper ends by recommending that the Air Force maximize its capabilities by keeping as many aircraft in the force structure as possible, with the stipulation that the it cannot afford to pay more for the three wings than it does currently. This stipulation eliminates the Alaskan alternative, since it would cost the Air Force almost $100 million/year more than keeping a wing in Europe. Also, the training grounds in Alaska can be better used for Red Flag-type exercises.

Given the preceding explanation, the Air Force should send the first wing to Nellis, saving $10 million/year over current costs. Nellis would also provide ample range space for LANTIRN training.

The second wing should be deactivated, with the F-16s being added to underequipped (in #'s of aircraft) Guard and Reserve F-16 squadrons. This step would save the Air Force $59 million/year while holding the number of aircraft in the inventory constant.

Finally, the third wing should also be deactivated, but the

aircraft should be used to replace the F-5s in the regular force structure. Though reducing overall numbers of tactical aircraft is not a welcomed move, especially after the Air Force already reduced its number of fighter wings from 37 to 35, it does save the Air Force an additional $194 million/year, not counting the sale of the F-5s. Moreover, the aggressor squadrons, which now fly the F-5, will receive a more capable aircraft with which to challenge US pilots.

The previous three steps save the Air Force a total of $263 million/year. If even harsher budget cuts force further reductions in the force structure, the second wing could be deactivated and the F-16s used to replace reserve F-4s or A-7s--instead of being added to current aircraft in the Guard or Reserve. Total yearly savings would then reach $419 million.

This paper ends by making two final suggestions. First, NATO will be concerned that US aircraft sent back to the United States may not remain assigned to NATO wartime roles. By designating various squadrons as having European-only missions, or by sending these same squadrons to Europe more often for training, the Air Force will send a message that the US is still committed to sending those aircraft to Europe.

The second suggestion is for the Air Force to focus on its redeployment capabilities. The more weapons and personnel based in the United States, the more the military relies on airlift capabilities. Though this paper assumes the Soviets will accept mobilization constraints to offset this vulnerability, it is

possible that a rapidly escalating crisis would overload the present airlift system. Some of the savings from CFE could be invested in improving this capacity.

In summary, the Air Force can accept three wings of F-16s from Europe with minimal loss of capability. By investing the savings obtained from lower operating costs for the three wings, the Air Force can virtually eliminate any damage done to its ability to accomplish its mission in Europe and the remainder of the globe.

Introduction

Negotiations commenced in March between NATO and the Warsaw Pact to discuss reducing Conventional Forces in Europe (CFE). As a precondition to these talks, NATO ministers declared last year that tactical aircraft could not be included. Though the Soviets agreed at the time, they now appear to be having second thoughts. Soviet foreign minister, Eduard Shevardnadze's recent statements that the Soviets will reduce their number of tanks only if the United States acts likewise regarding tactical aircraft, seems to suggest that the subject of the talks is far from settled.[1]

These changes in Vienna have forced Air Force leaders into somewhat of a corner. The Air Force is interested in supporting the current NATO and U.S. policy of no aircraft in CFE. However, as the probability of including tactical aircraft in the talks grows, it becomes important for the Air Force to study publicly what it would do with the airplanes that could be banned from the Atlantic to the Urals region. This paper is intended to be a starting point for the Air Force as it begins thinking about the various alternatives at hand for accommodating extra tactical aircraft in the United States.

A background section sets the scene for the remainder of this study by looking at why it is likely that tactical aircraft will be included in CFE. Next will be an overview of the basic characteristics of the U.S. aircraft that might be considered in

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[1] Fred Kaplan, "US officials see Soviet arms initiative as a mixed blessing," Boston Globe, 8 March 1989, p. 12.

an agreement. This paper argues that the airframe most likely to be selected is the F-16, a political compromise between other types of aircraft that each side would prefer to include.

The question then becomes, "What should the Air Force do with the F-16s removed from Europe?" Four options will be the focus of this paper. One, F-16 wing(s) could be moved back to base(s) in the United States. Two, the F-16 wing(s) could be deactivated and the aircraft placed in the Guard or Reserve as an addition to their present strength. Three, F-16s from deactivated wing(s) could be used to replace older aircraft in the inventory. Finally, if an arms control agreement would so state, the aircraft would be destroyed.

By viewing the Air Force as an actor interesting in having its forces based in Western Europe as early as possible during a crisis, one sees that the previous options are already listed in order of desirability. However, the critical question remains, "How many aircraft could these options legitimately support?" A framework designed to answer such a question follows. It identifies the economic and operational merits of each option as increasing numbers of F-16s are brought back from Europe. After analyzing each option's potential capacity, this paper ends by recommending ways in which the Air Force might make the best use of the former European-based F-16s.

Background

CFE (moving towards aircraft): The Vienna talks on reducing

Conventional Forces in Europe commenced in March with a public understanding between NATO and the Warsaw Pact that ground forces would be the only focus of the negotiations. NATO's position since last year has been that only those weapons in the Atlantic to the Urals region (ATTU) capable of seizing and holding territory should be part of the Vienna talks.[2] Soviet acquiescence on this point startled the international community, since the probable outcome of such an opening position was major ground force reductions for the Warsaw Pact and few for NATO. Though largely one-sided reductions on the part of the Warsaw Pact seems necessary, given the numerical superiority and offensive character of its ground forces in Eastern Europe,[3] it is puzzling that the Soviets would commit themselves to a course of action that ignores its own historic concerns about NATO's tactical aircraft. The recent change in the Soviet's position has erased the need to answer such a question. What remains to be seen is whether room for an agreement exists between the two adversaries.

NATO and the Warsaw Pact face a long road of negotiations if CFE is to produce any meaningful results. The fact remains, however, that the Soviets have already committed themselves to making extremely large reductions in various categories of ground

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[2] Schuyler Foerster, William A. Barry III, William R. Clontz, and Harold F Lynch, Jr., Defining Stability: Criteria for Conventional Arms Control in Europe, draft, n.p.

[3] For instance, Foerster cites the following IISS numbers: Tanks--(NATO 22,200; WTO 53,300), ART/MOR/MRL--(NATO 13,500; WTO 44,300), AIFVs/APCs--(NATO 6,200; WTO 23,600), ch 3, p. 3.

forces while demanding comparatively small NATO cuts in the same areas.[4] What the Soviets have asked for, however, is a reduction in NATO's tactical air strength--a request that both sides originally agreed would not be made during the first round of CFE.[5] As might be imagined, there seems to be little agreement between the two sides about the legitimacy of this request.

The Warsaw Pact views aircraft as offensive weapons capable of reaching past any front line of battle and, "...delivering powerful strikes against the rear infrastructure and troops to the entire depth of their deployment."[6] The superiority of NATO tactical aircraft in terms of quality and numbers, add the Soviets, give NATO an advantage that compensates for the Warsaw Pact's lead in ground forces.

NATO officials counter Soviet arguments with an explanation of NATO's strategy of Follow On Forces Attack (FOFA). In order for NATO to halt an attack by the numerically superior Soviet ground forces, NATO tactical air forces must fly behind the Warsaw Pact's front lines and interdict "the enemy's rear to

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[4] The Warsaw Pact has proposed that they reduce their tanks by 33,384 and artillery by 23,059, while NATO cut its numbers in the same categories by 4,604 and 8,559 respectively. See Foerster, ch. 5, p. 6.

[5] Interview with Ambassador Robert Blackwill, 17 November 1988 at the Kennedy School of Government.

[6] See Foerster, ch 5 p. 21 and Ray Allison, "Current Soviet Views on Conventional Arms Control in Europe," Arms Control, Sept. 1988, p. 145.

keep... ...second and third echelon forces from piling on."[7] Though tactical aircraft might fly what the Soviets would consider offensive missions inside the Warsaw Pact, their use is part of a defensive strategy designed to halt an attack by numerically superior ground forces.

The purpose of this paper is not to adjudicate the debate over the place of tactical aircraft in CFE. However, this writer assumes that the Soviets will not follow through with their CFE offer to reduce their ground forces by a substantial amount unless U.S. aircraft are reduced in some fashion. It is unlikely that NATO negotiators would want to force the Soviets into, what the Soviets feel, are one-sided reductions. The Soviets could never sign an agreement that makes them a clear loser in the eyes of Soviet citizens and allies--which a focus on only ground forces might do. Instead, NATO (and Warsaw Pact) negotiators must arrive at an agreement that appears to address the military concerns of both sides.

Yet, an agreement involving aircraft should not be signed for agreement's sake. A soon to be released study by members of Harvard's National Security Fellows program highlights three key concerns that must be addressed for a successful agreement to arise out of CFE:[8]

> [C]onventional arms control efforts should focus on measures that go beyond force reductions for the sake

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[7] A quote from SACEUR in: Robert S. Dudney, "Eight Principles," Air Force Magazine, April, 1988 p. 65.

[8] Foerster, Ch 1, p. 7.

> of parity... The result would be an integral package of measures that together accomplish three essential purposes. First, they should maximize the time required to initiate an attack. Increasing the indicators of hostile intent reduces the chances of surprise. Second, they should increase the transparency of the mobilization process. Reducing the ambiguity of warning indicators enables more timely response in a crisis. Third, they should preserve the defender's ability to respond effectively and in a timely manner. If one's capacity to mount a credible and cohesive defense is undermined, an increase in warning of impending attack is of little utility.

Given these goals of conventional arms control, two key Soviet concessions are necessary before NATO is likely to reduce its numbers of tactical aircraft.[9] First, the Soviets must agree to pull back substantial numbers of ground forces to locations beyond the Urals. Fewer Soviet forces would lessen the requirements for FOFA at the start of a war, since a surprise attack by the Warsaw Pact would met by NATO ground forces of equal numbers. Second, a mobilization freeze (on Soviet ground forces) of sufficient duration is necessary so that if the Warsaw Pact decides to go on the offensive NATO would have the time to generate sufficient defensive forces. Assuming the Soviets take longer to deploy and that NATO has the ability to detect those moves, and given the comparative ease of redeploying aircraft to Europe in a crisis (versus ground units), this writer assumes that some U.S. tactical aircraft will be removed from the ATTU region.

Aircraft (arriving at a compromise): Having identified

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[9] Foerster interview, John F. Kennedy School of Government, April 15, 1989.

those conditions under which tactical aircraft would be included in an agreement, attention can now turn to determining what U.S. airframe(s) would be selected. It is unlikely that the Air Force will have a large role in these discussions. Instead, the decision will be a political compromise, driven by each side's perceptions of different aircrafts' capabilities and how those capabilities influence stability in Europe. This paper now looks at the four primary candidates and how various NATO and Warsaw Pact concerns makes them a likely or unlikely choice.

The A-10[10] is the first aircraft to be placed under the negotiating microscope. A sub-sonic air to ground fighter designed for close air support, the A-10 loiters over the battlefield and supports ground forces by destroying enemy tanks and other ground targets with its large gatling gun as well as various other armaments it carries under its wings. Though a vital weapon for supporting ground forces, the Soviets do not view it as an offensive weapon by itself. Its range is approximately 285 miles, but it doesn't have the speed to penetrate beyond the heavily defended forward edge of the battle area--making the A-10 an aircraft that the Soviets are unlikely to view as capable of carrying out a surprise attack against their key command and supply installations inside the Warsaw Pact. The Soviets lack of interest in the A-10 seems to virtually eliminate the chance of this aircraft being removed

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[10] All performance data for the A-10, F-111, F15, and F-16 can be found in IISS, The Military Balance 1988-1989, (London), p. 238.

from Europe in the context of CFE.[11]

The next candidate is the F-111, the aircraft the Soviets are most eager to ban. This supersonic ground attack fighter has a combat radius in excess of 1,000 miles, enabling it to strike targets inside the USSR. It is also a dual-capable aircraft, meaning it can carry conventional or nuclear weapons. Unfortunately for those interested in an easy compromise, the F-111 is also the aircraft NATO is most unwilling to give up. In the post INF era, the F-111 remains NATO's most effective nuclear capable weapon system. SHAPE's Chief of Staff, General Robert H. Reed, states that dual capable tactical aircraft have become the principal provider of "deliberate nuclear escalation."[12] NATO's current strategy of flexible response relies on the threat of nuclear escalation to deter the Soviet conventional forces from attacking in the first place. A final reason for NATO not to give up the F-111 is related to current West German concern over the presence of tactical nuclear weapons being stored on its

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[11] At least for the near future, though A-10s are due to begin being phased out of service in FY 92. Frank C. Carlucci, Annual Report to the Congress, Fiscal Year 1990, p. 160.

Besides the Soviets not being interested in the A-10, there is another reason for NATO negotiators to keep it in Western Europe. Of all the aircraft under consideration, the A-10's role of close air support most ungently requires its pilots to train where they will fight. A-10 pilots would support ground forces in a chaotic atmosphere that would require the pilots to be intimately familiar with the lay of the land if they were to respond to calls for help. This argument could also be made for any other Close Air Support aircraft that might replace the A-10.

[12] Edgar Ulsamer, "Winds of Change in Tactical Warfare," Air Force Magazine, April 1988, p. 45-6.

soil.[13] The presence of F-111s in the United Kingdom is an important signal that the nuclear burden is being shared by other NATO members. All things considered, then, this aircraft has a very low potential for being included in any CFE agreements.

The third aircraft to be discussed, the F-15, is NATO's primary air superiority fighter.[14] Though the air to air role is usually understood by both the Soviets and Americans as defensive, the F-15 does have an unrefueled combat radius of over 900 miles--something the Soviets are sure mention as being capable of striking deep into the Warsaw Pact. However, the F-15 cannot easily be configured for an air to ground role. Moreover, its pilots train exclusively for the air to air mission--making them comparatively ill-suited for a ground attack mission.[15] Finally, the F-15's role of defensive counter air would become more important if some U.S. ground or air forces are sent back to the United States. In the event of a Soviet attack on Europe, the F-15's would have to protect NATO's airfields, supply facilities, and troop staging areas from Soviet bombers.

The final aircraft to be thrown into the CFE aircraft debate

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[13] Foerster, ch 2, p. 14.

[14] The F-15E, a two seat ground attack version of the F-15 is not mentioned in this paper, since it has not yet been deployed in the European theatre. When it arrives, its characteristics will be similar to the F-111's. As of this paper's writing, not enough information exists to warrant including this airframe as a candidate for serious analysis.

[15] One way to identify true air to air units is to look at how they train. If a majority of their time is spent on the bombing range, one might seriously question the air to air label. Still, this method is constrained by verification problems.

is the F-16, NATO's primary multi role fighter. Its interdiction role--the bombing of supplies, reinforcements, and command-related installations far behind the forward edge of the battle area--is the one that most concerns the Soviets. In addition, it is a very adaptable aircraft that can be used in air to air combat or close air support. Though its combat radius is only 340 miles in its ground attack configuration, the Soviets see this dual capable (conventional or nuclear weapons) aircraft as being at the heart of NATO offensive plans to destroy its rear echelon forces through the strategy of FOFA (follow-on-forces-attack).[16] From NATO's perspective, the F-16 is vital for the success of FOFA, a strategy that is necessary to stop the momentum of a Soviet surprise attack. Given the mobilization constraint placed on Soviet Ground forces earlier in this paper, however, it might be possible for less F-16's to be based in Europe, since F-16 squadrons would have more time to redeploy if the Soviets began to mobilize.

Having looked at the Soviet's concern over the F-16's capabilities and NATO's reluctance to part with this aircraft, there are important reasons why NATO negotiators should push for an F-16 compromise. First, some F-16s in Europe are to be equipped with Low-Altitude Navigation and Targeting Infrared System for Night (LANTIRN)--meaning pilots would be required to train at low altitudes at night. The West Germans may severely restrict this training, as they have done for daytime training in

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[16] Allison, p. 145.

the aftermath of numerous military crashes over the past year. LANTIRN equipped airplanes would have to go elsewhere, possibly the United States, for training--on a continual basis.

A final reason for NATO to consider the F-16 compromise is that a number of other NATO members have this aircraft (a total of 330).[17] This is not the case for the other three aircraft discussed previously. In the event of a Soviet surprise attack (post CFE) against equal ground forces, these non-US F-16s could provide essential support while US squadrons redeploy.

In summary then, the Soviet dislike of the F-16's offensive potential and its ability to carry nuclear weapons, when combined with NATO's need to find new training areas for the F-16[18] and the United States' ability to redeploy the F-16s in time to deter the Warsaw Pact, makes this aircraft the one most likely to be included in a CFE agreement that embraces tactical aircraft. Given the preceding multitude of assumptions, this paper now explores the crucial question, "Can the Air Force accommodate the F-16s removed from Europe?"

Possible Options

Overview: If NATO is attacked by Warsaw Pact forces, the United States would want to send its US-based forces with NATO wartime missions to Europe as quickly as possible. It's fairly obvious that, given unlimited money and space, the Air Force

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[17] IISS p58.

[18] This also applies to non-LANTIRN equipped aircraft.

would choose to place any F-16 wing coming out of Europe into the regular force structure.[19] It is also clear, however, that the Air Force is not the recipient of unlimited funding or an infinite number of airfields and thus, it might have to consider other ways in which it would deal with various numbers of F-16s coming out of Europe--if the regular force structure option is not a viable one. When thinking about the first option, or various alternatives, this paper assumes that the Air Force wants to maximize its geostrategic capabilites--its ability to provide the highest quality forces to NATO in the shortest amount of time. It will want to place as many ex-European F-16s into the regular force structure as it can (limited by dollars and the availability of suitable airfields and airspace). After that, it will place as many aircraft into the next most attractive alternative and so on for however many options exist.

When looking at each option, it is important to recognize not only the Air Force's geostrategic concerns, but also NATO's perception of those concerns as a measure of US commitment to NATO. If the Air Force chooses to place a wing of F-16's in the Reserves, it needs to be aware of NATO's concerns about how those aircraft would be used in a crisis. For example, the Air Force might designate publicly that F-16s removed from Europe and placed in a new Reserve wing would be given a special status and mobilized with the first regular units. Each option looked at in

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[19] As opposed to the reserve force structure, assuming that reserve units take longer to deploy overseas and are less capable, since they train less frequently.

this paper will be formulated keeping in mind the possible concerns of other NATO members about the wartime roles of aircraft that are pulled out of Europe and are moved back to the United States.

The following options explore a fairly broad range of policy choices available to the Air Force. Remembering that the Air Force wants to keep its forces at the highest level of training and readiness, it would prefer to (1) bring any F-16 wings removed from Europe back to the US and keep the each unit intact in the regular force structure. If this option cannot handle all of the aircraft, the Air Force would then choose to (2) disband the remaining F-16 wings sent back to the United States and use the aircraft to enhance the strength of the Guard and Reserve.[20] Next, F-16s could be (3) used to replace older aircraft, though this would reduce the Air Force's overall strength. Finally, if an arms control agreement would so state, the Air Force would have to destroy the aircraft.

Before revealing the full structure of each option, it is necessary to talk about how many F-16s might be sent back to the United States from Europe. There are three wings of American F-16s currently stationed in Europe. Each wing is comprised of 72 aircraft and approximately 3500 military personnel.[21] Two are

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[20] This assumes that all F-16 squadrons in the regular Air Force are operating at full capacity.

[21] 3500 is an estimate of a fighter wing's strength. Manning levels for specific wings may be different. IISS does not list the number of F-16s assigned to the two wings in West Germany. However, Torrejon has 72 aircraft, so the other two

located in West Germany, at Hahn and Ramstein AB. The other is stationed at Torrejon AB in Spain.[22] It is difficult to say which of these wings would be selected if only one or two were chosen. This writer eliminates the problem by assuming all three are removed. For the sake of estimating costs later on, however, it is necessary to assign each wing a priority number, since two of the bases (Hahn and Torrejon) would have no further peacetime function but would still be kept open. These costs would be added to the cost of maintaining the wing in the United States--regardless of the option. Assuming that F-16s will be pulled out of Hahn first, Ramstein second, and finally Torrejon,[23] each option can now be discussed in more detail.

1. **Move F-16 Wing(s) Back to the United States:** In this situation, an F-16 wing would be moved back from Western Europe and based permanently in the United States. However, all or part

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wings will be assumed to have 72 aircraft as well.

[22] "Guide to Major Air Force Installations Worldwide," Air Force Magazine, May 1989, pp. 154, 159, and 160.
The F-16s at Torrejon are in the process of moving to Crotone AB in Italy (under construction). At this time, it appears that Crotone's only peacetime function would be to house the F-16 wing. Thus, any statement in this paper referring to Torrejon would apply later to Crotone.

[23] Though this paper assumes that all three wings are removed from Europe, the order in which they are pulled out influences the economic costs. All other things being equal, F-16s pulled out of Ramstein cost less to relocate in the United States than those from Hahn and Torrejon, since Ramstein has other peacetime missions and would remain open even without the F-16 wing. The cost keep Torrejon or Hahn open, on the other hand, once those wings left, would have to be counted in the total cost for supporting either of those wings--once they are moved.

of an airfield in Europe would be allocated to this wing if it was ever recalled by NATO. Though this option can be studied in a number of variations by adjusting the amount of forward based supplies left in Europe for a wing's wartime redeployment, this study assumes that a fully stocked base, minus the planes, people, and a dependent War Reserve Spare Kit(WRSK), is maintained in Europe.

Two United States locations will be looked at as possibilities for housing an F-16 wing coming out of Europe. The first is Nellis AFB, located near Las Vegas, Nevada. This is an attractive alternative, because an F-16 wing was recently deactivated at Nellis, and the buildings and hangars remain. The second location consists of one of two possible bases in Alaska: Eielson AFB near Fairbanks and Elmendorf AFB near Anchorage. Though a number of facilities would need to be built, Air Force practice ranges already in existence are not being used to their capacity.[24]

The selection process used to arrive at Nellis and Alaska was essentially a survey of each CONUS Air Force base's ability to absorb 72 fighter aircraft and approximately 3,500 additional military personnel. All possibilities on the east coast were ruled out due to airspace limitations. The air to air and air to

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[24] Only one of the two bases can be chosen. This writer assumes that lengthy environmental impact studies of the effect of 144 fighter aircraft and 7000+ military personnel on the Alaska environment would probably rule out such a move.

ground ranges were being utilized to their full capacity.[25] In the remainder of the United States, the range space doesn't exist,[26] or the area around current bases is so densely populated that the additional noise created by an extra 72 fighter aircraft is assumed to be unacceptable.[27]

Finally, if either of these alternatives appear feasible, the Air Force must keep in mind how NATO views the options. Any aircraft moved to Alaska would become attached to the Alaskan Air Command--making the wartime mission of these aircraft questionable, since they could also be used in the Pacific theatre.[28] In the Alaska case, the Air Force should consider making any F-16 wings assigned to Alaska part of TAC (Tactical Air Command). This might help allay European fears that the F-16s would be used for other purposes in a large scale war.

2. **Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve:** This choice entails

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[25] Various interviews with Nellis and Pentagon officials.

[26] A base that does not have it own range or access to another base's is ground for elimination. The strict environmental studies required, combined with an ever-increasing population density in the United State's rural areas, make the acquisition of new range space highly unlikely.

[27] For more on base and range crowding see C.V. Glines, "Closing In on the Airfields," Air Force Magazine, January 1989, p. 78. and Molly Moore, "Land Squeeze Hampers U.S. Military," The Washington Post, Dec 31, 1988, p. A1.

[28] General McInerney, Commander of the Alaskan Air Command, has mentioned a plan under consideration in the JCS to make the AAC subordinate to CINCPAC (Commander in Chief, Pacific). See, James W. Canan, "Pressure on the Northern Frontier," Air Force Magazine, Feb 89 p. 58.

removing an F-16 wing from Europe and giving the aircraft to various Guard and Reserve units. The F-16s would not replace older aircraft but instead they would be additions to strength of various units. The Air Force would benefit by keeping its aircraft numbers constant. However, costs would be less than having these planes in the regular force structure, since the Air Force would then reduce its number of active duty personnel by the number of wing personnel no longer attached to the disbanded wing[29]. This option provides room for one wing of aircraft (72 total), since some Reserve units are operating below their capacity.[30]

As in the first option, the Air Force must be sensitive to the concerns of NATO over there wartime role of these aircraft. If the Air Force places F-16s into various Guard or Reserve units, it should consider giving some Reserve units special status--assigning it an exclusive European mission and guaranteeing this to NATO allies. Otherwise, NATO will see F-16s formerly assigned to Europe being placed in squadrons that have a number of wartime missions--Europe being only one of them. The

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[29] Squadron personnel, however, would still be needed to support the same number of aircraft. Manpower slots would simply be allocated to the Reserve units gaining the aircraft.

[30] According to IISS figures, between the ANG and Reserves there are 5 squadrons of F-16 with 20 aircraft in each, meaning 20 additional F-16s could be accepted (assuming 24 PAA). In addition, other squadrons (F-4s and A-7s) hover around approx 18 PAA in the ANG and 20 in the Reserve [giving a total of 29 undermanned F-4 and A-7 units] Assuming that nine of these squadrons convert to F-16s in the next few years, 72 F-16 could be accommodated in the Guard and Reserve basing structure (not counting these planes as replacements!)

flexibility afforded a unit by training for various missions in different parts of the world may please Air Force planners, but NATO is certain to wonder whether it can count on seeing those aircraft in wartime.

3. **Disband the F-16 Wing(s) and use the Aircraft as Replacements:** Replacing older aircraft with F-16s allows the Air Force to improve the average quality of its aircraft while trimming its overall strength. This might be an important consideration as military budgets are being reduced. Looking at this option, there are two promising alternatives. First is to replace the remaining F-5 aircraft in the regular Air Force with F-16s, roughly 72 aircraft.[31,32] This would give the aggressor squadrons more capable aircraft with which to simulate enemy tactics. Replacing the F-5s would also save money, assuming it costs less to maintain the newer F-16s. A second possibility is to replace some of the A-7s or F-4s in the Guard or Reserves with F-16s.[33] These older aircraft would then be removed from the

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[31] IISS figures list 101 F-5s in the regular Air Force. Subtracting 20 that were taken out of Nellis (see AF Times, 23 January, 1989) plus the 19 in the United Kingdom (it's doubtful that the Soviets would allow aircraft banned from NATO to be used as trainers in the same theatre) gives a final total of 62 aircraft. To keep numbers round (blocks of 72, since wings are being moved around) the remaining aircraft are assumed to replace F-4s or A-7s, though the costs of these remaining 10 F-16s are included in the F-5 alternative.

[32] This writer assumes that all F-16 squadrons in the regular force structure are at full capacity, thus no additional F-16s can be placed in these units.

[33] The F-16's multi role capabilities are assumed sufficient to replace the aircraft mentioned in section.

inventory.

Again, the Air Force must be aware that NATO cares strongly about the continued commitment of the United States to assign European wartime roles to aircraft that are pulled out of Europe due to CFE. When replacing the F-5s, which are stationed at various locations worldwide, it isn't practical to publicly assign these aircraft to NATO during a war. Some of these aircraft are based in the Far East and should remain there during a major crisis. As with the previous option, the Air Force might consider giving a Guard or Reserve Wing special status--assigning it an exclusive European mission and guaranteeing this to NATO. Of course, this limits the flexibility of that wing. However, it might be a cost the Air Force should agree to incur, given Europe's vital strategic importance.

4. Destroy the F-16s: This is not an option the Air Force would choose to employ. Replacing older aircraft with F-16s and destroying (or cannibalizing) the older models seems the most drastic measure the Air Force would select. It is possible, however, that an arms control agreement may require some of the F-16s to be destroyed. Though the chance of this happening seems to be remote, this paper will try to determine the actual costs of such an event.

Framework for Evaluation: Measuring the Effects

Given the Air Force's preference to accommodate as many F-16s using the first option, followed by the second, and so on,

one needs to determine how many aircraft each option can realistically house. Two categories will be used to measure the Air Force's ability to place additional F-16s in the United States: economic and operational. Economic constraints would play a very large role in thinking about what to do with F-16s sent back from Europe. Though the Air Force would like to keep the wings intact, the costs associated with building new facilities, training ranges, and possibly entire new bases, may rule out many alternatives. Economic arguments for and against various plans need to be paired, however, with operational considerations. Though space might exist at various bases within the United States for more F-16s (a cost effective solution), the training environment may be so saturated that additional aircraft would overcrowd the airspace--reducing the quality of everyone's training. With these thoughts in mind, one can discuss in more detail this paper's focus on economic and operational tradeoffs.

Economic Effects: The goal of this category is to measure the cost of each alternative to provide the same level of service that is currently the case in Europe. For instance, if an F-16 wing is moved from a West European base to Nellis AFB in Nevada, the total cost would include the cost of maintaining minimal facilities at the European base,[34,35] plus the cost of keeping

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[34] The cost of maintaining the base in Europe from which aircraft are removed should be counted only when those aircraft were the sole peacetime occupants of the base. If other aircraft remain at the base, it is still open and, assuming the departed unit leaves it buildings intact, the wing of aircraft moved to the United States could return if needed.

the wing at Nellis, plus the cost of redeploying the wing to Europe for training once every three years.[36] Since the cost figures for training outside of Europe are not available for the wings presently in Western Europe,[37] it is assumed that these costs roughly equal the cost of a wing at Nellis (for instance) to redeploy to Europe for training once every three years--thus they cancel one another.[38] Given this assumption, this paper measures three types of costs for each alternative: (1) moving costs, (2) costs for new construction, and (3) operating and maintenance costs--which include the costs of operating a bare base over in Europe if that base was left vacant. An outline of these costs shows the major components of each category.

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[35] Keeping vacated airbases at a certain level of readiness serves another purpose besides limiting the harm done to a wing's ability to perform in Europe when it has been sent back to the United States. Foerster argues that reducing the number of airbases in Europe will decrease rather than increase stability in Europe. "Fewer airfields increase the density of aircraft on the remaining fields, thereby increasing the incentive to target those airfields early in a crisis. ...Rather than restricting airfields, therefore, a preferable approach would be to preserve their survivability." (Foerster, ch.5, p. 32). Any CFE agreement that reduces the number of tactical aircraft in Europe, then, should not eliminate the airfields from which the aircraft are taken.

[36] AF average per squadron in the United States. This is done to familiarize the pilots with Europe's environment.

[37] Due to numerous restrictions on training, units in West Germany, for example, must deploy to Spain in order to make use of air to ground bombing ranges.

[38] More precisely, one squadron deploys overseas for training approximately once every three years. Thus, one can say a wing deploys one squadron/year = one wing/three years.

SUMMARY OF VARIOUS COST CATEGORIES

1. Moving

   Equipment
   Personnel

2. New Construction

3. Operating and Maintenance

   Wing Non-Squadron Personnel Pay Costs
   Squadron Operation and Maintenance Costs
   War Reserve Spare Kit (WRSK)
   Bare Base Costs

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1. Moving. These costs are incurred when moving a wing's personnel and equipment to its new destination. Since the heavy equipment was to be left at the European base (in order to give that base a capability to support aircraft) deployment costs for aircraft and basic maintenance equipment were used to measure the cost of moving equipment.[39] Personnel moving costs are calculated using Pentagon estimates (see Appendix A).

2. New construction. These costs apply for those situations in which a wing moves to a new location and needs new facilities.[40] The only bases that would require new buildings

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[39] Taken from AFR 173-13, U.S. Air Force Cost and Planning Factors, September 2, 1986, table 7-3.
Also missing from this analysis is the cost of replacing the heavy equipment left in Europe that would be needed at the new base. When amortized over the life of this equipment, the discrepancy is assumed to be minimal.

[40] All construction costs are amortized over thirty years at a 10% discount rate. Other one-time costs, such as WRSK and moving costs are amortized over five years at 10%. For more detailed information regarding the economic model, see Appendix A.

are those in Alaska. This writer assumes that all operations and maintenance buildings would have to be duplicated. Additional housing would also need to be built.[41] Not included in this paper are the costs required to refurbish or modify existing structures, though these costs would be comparatively small for the remainder of bases in this study.

3. Operating and Maintenance. The final category in the cost portion of this paper is termed O&M, operating and maintenance costs--the money required to support a wing's day to day existence. These can be divided further into four subcategories: (1) wing non-squadron personnel pay costs, (2) squadron O&M costs, (3) WRSK costs, and (4) bare base costs[42].

The primary tool used for the O&M portion of the analysis is the Air Force Cost Center's SABLE model.[43] The SABLE model is used to estimate the yearly costs of operating an aircraft squadron. It measures the marginal cost that can be attributed to adding one additional squadron of aircraft. The model incorporates a multitude of flying and non-flying costs, but doesn't include such items as military construction or family housing.[44] Since this paper relies heavily on this model, it is

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[41] See Appendix A for a more detailed list.

[42] For those instances where the wing is the base's only peacetime occupant.

[43] Systematic Approach to Better Long-Range Estimating (SABLE) Model Handbook For Aircraft Operating and Support (O&S) Cost Typicals. Prepared by the Air Force Cost Center, September, 1988.

[44] See Appendix B for more details

important to note that it is far more accurate at estimating the costs of wing's operations when that wing is not the only occupant of the base. Fixed costs, such a minimum levels of security police, civil engineering... are not included in the SABLE model. This is acceptable if a wing of F-16s leave Ramstein (a multi-wing base), because the remaining units can absorb the fixed costs. However, at a one-wing base such at Hahn, it is likely that wing O&M costs are underestimated.[45]

Looking more closely at the sources for wing O&M costs, wing non-squadron personnel pay costs include the pay of all wing personnel not covered in the SABLE squadron model. This category partially compensates for the SABLE model's lack of fixed costs. The only fixed costs not included in this study are non-personnel expenditures.

Squadron O&M costs are taken directly from the model. Since a wing is composed of three aircraft squadrons, SABLE figures are multiplied by a factor of three.

War Reserve Spare Kit costs are estimated for all units not stationed in Europe. Though the cost of these kits varies with a unit's mission, a single estimate of $17.5 million/squadron is used. For Guard or Reserve units receiving F-16s as replacements

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[45] An extreme example may help. If fixed costs total $100 million for a base, and there are three wings present, each wing incurs 1/3 of the costs. Using the Sable model, one may arrive at a variable cost of an additional $150 million per wing. This does not include the fixed costs. Now, compare this to a case where only one wing occupies the same base with the same fixed and variable costs. In both instances, this paper would ignore the fixed costs, but the error is greater for the one-wing example (I've ignored $100 million instead of $33 million).

for older aircraft, this writer assumes an entire new WRSK kit would be needed.

Finally, bare base costs are estimated for those units moving to the United States and leaving their old base unoccupied. This calculation is predicated on the assumption that bases in Europe are already scarce, so it is in the interest of the United States to keep open those it has.

Given the previous costs, the Air Force is interested in determining whether it can afford to support F-16s that might be moved out of Europe. Costs also vary according to aircraft type and geographic region. If the cost of supporting a wing is higher at a new base than the previous one, Air Force leaders may have to consider less expensive options. Valuable as such an analysis may be, there are a host of non-economic concerns that come into play when thinking about moving aircraft from base to base. The next category will explore an equally important analytical viewpoint.

Operational effects: The second measure of the costs and benefits associated with moving a certain number of F-16s out of Europe is the ability of those aircraft at the new location to accomplish the same mission. For an F-16 wing moving from Western Europe to the United States that means two things: (1) being able to get back to Europe to accomplish assigned wartime missions and (2) maintaining a high level of readiness--the ability of a unit to perform its wartime role once it arrives at its forward base.

This paper largely ignores the redeployment problem, since it was assumed earlier that Soviet ground forces, in a CFE agreement, would have a variety of mobilization constraints placed on them--allowing present U.S. mobilization capabilities to suffice. There may be more military hardware and personnel back in the United States after an agreement, but there will be a commensurate increase in the amount of time that NATO has for mobilizing before the beginning of a conflict.[46]

Overlooking the redeployment problem, at least for the moment, there arises a second obstacle to measuring the operational effects of various options: how does one usefully measure readiness--or compare the ability of different bases in different part of the world to contribute to readiness? Former Secretary of Defense Carlucci's FY 90 Report to Congress had the following to say on the subject:[47]

> The combat readiness of our [air] forces is directly related to the quality and intensity of training they receive. Training quality is a function of numerous factors: flying hours; training munitions expenditures; range, target, and airspace availability; threat simulation; and training facilities.

To complicate matters, another key to enhancing a pilot's ability is the geographic concept of realism: a term that is meant to highlight the need for pilots to train where they are going to fight. The more realistic the training environment, the

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[46] The Air Force cites 72 hours as the time needed to deploy a tactical aircraft squadron from the United States to Europe.

[47] Carlucci FY 90 report p. 159.

better prepared one is to fight in it. For example, a ground attack squadron based in Alaska may practice on air to ground ranges with many trees. Pilots become proficient at picking out targets hidden in dense forests. Another ground attack squadron, based at Nellis in this case, practices on desert ranges and becomes proficient at identifying targets in that environment. Assuming both of these squadrons are assigned to bases in West Germany in wartime, the pilots who trained in Alaska will be better able, all other things being equal, to fight in the forest dominated region of central Europe.

If geographic realism was the only determinate of combat ability, however, everyone would be training in Europe. As Secretary Carlucci's statements indicate, pilots also need to train close to wartime limits. It does little good to fly only over the region in Europe one is assigned to defend if airspeed restrictions require pilots to fly no faster or lower than civilian aircraft. Wartime missions will be carried out at supersonic speeds and extremely low altitudes: placing unique pressures on pilots for which they must prepare during peacetime. Access to training ranges and airspace in which wartime flight conditions can be simulated is essential.[48]

There exists no one measure to show that one base offers better training conditions than another. For example, one might argue that Europe offers some of the poorest training conditions

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[48] Thomas J. Knodson, "Noise from Military Jets in West is Drawing Fire," New York Times, Jan. 11, 1987, p. A-1.

in the world, given the recent plethora of flying restrictions placed on the military after a number of crashes over the past year.[49] "USAFE ha[s] reduced training flight hours by about 40% over the last several years," and NATO is currently evaluating the use of training sites near Goose Bay Canada and Konya Turkey to compensate for European limitations.[50] The goal of this section of analysis is to try and maximize the various components of quality training. This will be done by selecting bases with (1) adequate air to air or air to ground ranges (depending on a wing's primary mission), and (2) with an environment that simulates a European climate.[51]

Analysis of Options

In this section the following possibilities are analyzed for economic and operational merit:

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[49] See Keith F Mordoff, "NATO Fighter Training Flight in Germany Halted Until Jan. 2," Aviation Week and Space Technology, Dec 19, 1988, p. 31. and "USAF European Command Suspends All Flights in Wake of F-16 Crashes," Av. Wk, July 11, 1988, p. 31.

[50] Keith F. Mordoff, "RAF, German Air Force Jets Collide Over Germany," Aviation Week and Space Technology, January 23, 1989, p. 29.

[51] The need for pilots to know the actual lay of the land in Europe is recognized by the Air Force, since it sends its US based squadrons to Europe at least once every three years
It might be helpful to send U.S. based pilots more frequently, but such an argument is strongest for close air support pilots. Though it's always nice to know where the major landmarks are when one's navigation aids malfunction, the Air Force seems to have struck a balance between what it sees as the need for area familiarization and the requirement for experiencing wartime tactics (less of the former and more of the latter if one must choose between the two).

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1. Move the F-16 Wing(s) Back to the United States

   Nellis AFB
   Alaska (Eielson or Elmendorf AFB)

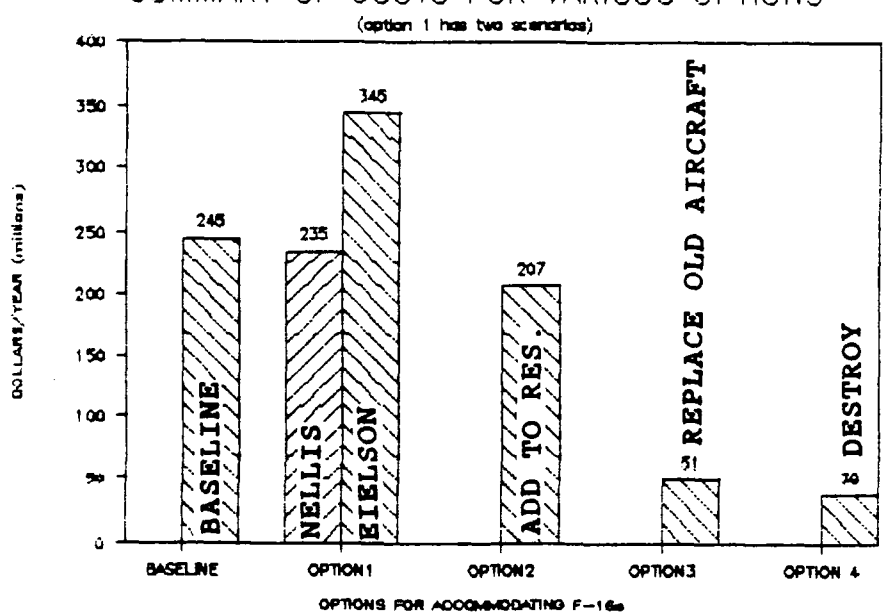
2. Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve

3. Disband the F-16 Wing(s) and use the Aircraft as Replacements

   For F-5s
   For F-4s and A-7s

4. Destroy the F-16s

Economic Effects:[52] The following graph summarizes the costs of the various alternatives available to the Air Force[53]:



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[52] For a full cost breakdown, see Appendix A.

[53] All costs for the four options include bare base support costs. For the alternative that houses the wing from Ramstein, yearly costs would be $21 million/year less. Elmendorf costs are not shown. They would be $10 million/year less than for a wing at Eielson.

1. Move the F-16 Wing(s) Back to the United States. The Air Force currently spends approximately $245 million/year to keep a wing of aircraft in Western Europe. Given this as a baseline, the Air Force could actually save $10 million/year by bringing a wing back to Nellis. Sending a second wing back, however, if it was to remain intact, would require an additional yearly expenditure ranging from $91 million to $100 million (since new facilities are needed in Alaska). This fact alone provides incentive to look closely at other options.

2. Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve. Placing 72 more F-16s into the Guard or Reserve would cost $207 million/year, saving the Air Force $38 million/year. Savings in this case result from a drop in personnel costs, since wing staff personnel would not be needed at the new bases--the Guard an Reserve units already have these people in place.

3. Disband the F-16 Wing(s) and use the Aircraft as Replacements. Replacing the F-5s in the inventory would cost only $51 million/year, compared to the current baseline of $245 million/year.[54] One must realize, however, that the Air Force is not saving money to support the same number of aircraft. Its overall numbers are being reduced by 72 aircraft, and it still

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[54] The only costs contained in this figure are amortized moving expenses and the cost of keeping the European base open. One might expect the yearly O&M costs for the F-5 to fall when replaced by the F-16, since it is a newer aircraft--an additional savings for the Air Force. The 10 remaining F-16s are assumed to replace older models of existing F-16's, be they in the regular or reserve force structure.

must pay $51 million/year. It doesn't save the full $245 million/year, because of the high costs of moving personnel and equipment back to the United States (amortized over five years) plus the cost of supporting a vacant base over in Europe. The same costs and arguments apply when one looks at replacing F-4s or A-7s in the reserves.

4. Destroy the F-16s. The final option, destroying a wing of 72 aircraft would still require the Air Force to spend $38 million/year. Again, this is due to the cost of moving planes and people back from Europe. After five years, the yearly cost would fall to $21 million to keep the vacant base in Europe open.

Operational Effects: As stated before, one must temper economic arguments for and against different basing options with an assessment of what is being gained or lost operationally. This section looks at each option to determine (1) redeployment costs and (2) the overall training atmosphere. These judgments can then be combined with the economic information to recommend a course of action for the Air Force.

Looking first at the baseline cases in Europe, one of the foremost advantages is not having to redeploy aircraft from the United States during a crisis. Moreover, there is no better place to train, in a geographic sense, than Europe--if that is where one intends to fight. However, a large negative must be placed next to these two benefits, because of the many training restrictions that have been placed on military aircraft--

especially in West Germany.

1. Move the F-16 Wing(s) Back to the United States. Looking at this first option, there is no redeployment problem as far as this paper is concerned, given the mobilization restrictions placed on the Soviets. Still, one might be concerned--especially with the Alaska option--about the great distance to Europe. It might be possible to fly a great circle route near the North Pole, making the distance from Alaska to Europe the same or shorter than from Nellis in Nevada. Since redeployment would occur during a crisis, however, it is likely that a wing would be flown over Southern Canada instead. If twenty-four C-141s, three 747s, and tankers for only the F-16s were available, it would take the wing approximately 50 hours to deploy to Europe, versus 46 from Nellis.[55]. Another possibility is to assign the Alaska wing to CINC-PAC in wartime and designate the wing formerly tasked with redeployment to Alaska as one that would go to Europe.[56] Thus, only one wing--instead of two--would need to be moved. Also, assuming this wing is located in the lower 48, it would take less time to get the aircraft to Europe--if time was that critical.

The next operational concern for Air Force leaders is whether the new bases would offer a good overall training atmosphere. Nellis AFB is located in desert environment--a

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[55] Calculations based on AFR 76-2, Airlift Planning Factors, 29 May 1987 and an interview with Lt. Col. Steve Sharkey, Pentagon.

[56] Canan, p. 58.

definite drawback for units that would fight in Europe.

Looking at range space, though, the state of Nevada is covered with air to air and air to ground ranges. Unfortunately, Nellis happens to be the home of Red Flag, a training exercise that draws squadrons from around the world. These units come for month-long periods to train in a wartime environment, practicing the high stress flight manuevers and joint tactics that would be required in wartime. The trouble with placing more aircraft at Nellis is that the ranges are currently being used from sunrise to sunset.[57] More aircraft at Nellis, then, would impose costs the other aircraft training there, since everyone's range time would be reduced. Though range space is open in southern Arizona, aircraft travelling there must refuel if they are to use the ranges for more than a couple of minutes. It was this dilemma that prompted the Air Force to select the 474th tactical fighter wing at Nellis (72 F-16s) to be deactivated when the Air Force reduced its strength from 37 to 35 tactical fighter wings.

What seems to have remained untapped, however, is the opportunity to use Nellis as a night-time training site for LANTIRN equipped aircraft. A wing of F-16s equipped with LANTIRN would be able to train at night when Red Flag exercises are not using the entire range complex. Since a number of F-16s in Europe will have this system, Nellis may offer very acceptable accommodations for these aircraft.

Alaska features an even more attractive training atmosphere.

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[57] Interview with former Nellis squadron commander.

Its air to air ranges equal the size of Nevada and are not close to being at their capacity.[58] Air to ground ranges are also open. Its long hours of darkness during the winter may actually help a wing equipped with LANTIRN, since it must train a great deal at night.

The climate, at Elmendorf (near the coast), is similar--though slightly colder--than Europe. Aircraft stationed at Elmendorf and Eielson are able to fly the same number of missions per year as those aircraft stationed in the lower 48.[59] If an F-16 wing wanted to specialize in air to ground missions, it seems logical to base them with the A-10s currently at Eielson--to make use of the nearby air to ground ranges. If the wing was to focus more on the multi-role capabilities, however, the Air Force should consider basing the aircraft at Elmendorf where the weather is milder.

One constraint that may keep a wing out of Alaska is the impact 72 aircraft and 3500 military personnel, plus their families, might have on the sparsely populated state. This also makes Elmendorf a popular choice, because the city of Anchorage is so near. Environmental impact studies would need to determine if Alaska's sometimes delicate ecosystem, and relatively small communities, could accommodate the extra presence of aircraft and people. Speaking from strictly a training perspective, however, Alaska offers an attractive alternative to the crowded and

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[58] Canan, p. 58.

[59] Canan p. 59.

restricted airspace of Europe and the contiguous United States.[60]

A final consideration not mentioned earlier in this paper is the alternative uses for the bases in Alaska. The Red Flag exercises held at Nellis provide US pilots from units all over the world with the best training in a combat environment short of war. Given the overcrowding of the ranges at Nellis and the ability of these exercises to improve the combat skills of American pilots, the Air Force should consider expanding this exercise to Alaska.

2. Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve. In this case, redeployment concerns would be the same as for the first option--assuming the unit is kept at a reasonably high level of readiness. Again, the mobilization constraint placed on Soviet troops would allow the wing sufficient time to fly back to Europe.

Moving to the question of training atmosphere, then, a new problem arises. Since F-16s would be sent to a variety of locations, about all one can say with certainty is that the number of aircraft in the Air Force inventory would remain the same--minimizing any losses in capability. It is nearly impossible to appraise overall training opportunities, since aircraft would be assigned to various squadrons across the country. Some units may have access to better overall training

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[60] It is also likely that assigning more pilots to Alaska would increase further the current pilot retention problem.

opportunities than in Europe, some may not. Also, pilots in the Reserves are, on average, more experienced--making the operational effect of adding F-16s to the reserves more difficult to determine.[61] The aircraft might actually be placed into more capable hands. At worst, some Guard or Reserve squadrons may experience marginally higher levels of congestion if the number of aircraft in that squadron are increased to 24 PAA.[62]

3. Disband the F-16 Wing(s) and use the Aircraft as Replacements. Looking at the third option, the Air Force would suffer a loss in its overall strength, since the force structure would be reduced by however many older aircraft were retired.

Redeployment time would be the same as for the first and second options--assuming that other units, regular or reserve, were assigned the former wing's mission in Europe. One can't ignore the fact, however, that somewhere operational capability is lost. There are less aircraft to do the same jobs. In this case, one could also consider redeployment time to mean the time it would take the Air Force to bring its aircraft numbers back to the level prior to a CFE agreement--regeneration time. For the

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[61] One might even argue that putting more high quality aircraft into the Reserves will allow the Air Force to hold onto its most valuable assets--its pilots--for their entire career, since many pilots now get out of the regular Air Force after their initial commitment expires (for a variety of reasons).

[62] Though the cost of running a reserve squadron is arguably less than a regular Air Force squadron, the cost information used in this study uses regular Air Force cost figures. This is advantageous, actually, since one can then assume that the units receiving additional F-16s would have a higher training budget per plane than they do currently.

F-5s which were sold, regeneration time would include the time to build new aircraft and create an entire wing (72 planes and 3500 personnel). For the F-4s and A-7s, if they were placed into storage, regeneration time takes into account the refurbishing of these aircraft and, again, the creation of a new wing. It is not the intent of this paper to estimate such time period with great accuracy, but one would surmise that bringing Air Force numbers up to previous levels would take longer than the mobilization constraint placed on the Soviets.

Moving next to the training atmosphere, it is again difficult to compare bases when aircraft are being sent to a variety of locations. Assuming that the present training environment at the bases receiving the F-16s sufficiently prepares those units for European wartime missions, the Air Force is losing mainly quantitative capability, not qualitative capability.[63]

4. Destroy the F-16s. The final option is the most severe loss the Air Force could suffer. Redeployment time would include the time necessary to build new aircraft. Assuming that other units pick up some of the former wing's missions,[64] the other major loss would be the disappearance of not the older Air

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[63] Though these pilots aren't training in Europe any longer, they still deploy to Europe for training once every three years. Moreover, the availability of training ranges for these new units is likely to be better than the rather dismal situation in Europe today.

[64] These would be units in the United States, so the same training environment costs and benefits apply as for options two and three.

Force aircraft but its newest. A CFE agreement of unimaginable good will on the part of the Soviets would be needed for this option to be worth even considering.

Recommendations

Maximize Capability First, Minimize Costs Second: There are three full wings of American F-16s stationed in Europe. Given the trend of declining defense budgets, the Air Force has already reduced its strength from 37 to 35 wings. It should avoid cutting its numbers any more if at all possible. This must be tempered, however, with the realization that the Air Force must work within its current budget. It cannot afford to pay more for the alternatives to the European F-16 wings than it currently does. Given these concerns, this paper recommends that the Air Force do the following with those aircraft that are sent back:

1. House the first wing at Nellis. The facilities for this wing are already in place. Assuming that this is a LANTIRN equipped unit, the training difficulties experiences by the 474th shouldn't be repeated. Even after making allowances for maintaining the base that was left over in Europe, the Air Force can save $10 million/year compared to what it is currently spending in Europe.

2. Disband the second wing and use the aircraft to bolster the strength of the Guard or Reserve. There are just too many reasons not to place another wing in Alaska--the primary one being that the Air Force can't afford to lose this area as a new

Red Flag training site. Additional F-16s in the Guard or Reserve would mean placing better aircraft in the hands of more experienced pilots. The savings over current costs would be $49 million/year. Some of these funds could be used to send the squadrons back to Europe more frequently, if Air Force planners felt these squadrons trained in too arid or sunny a climate.

3. Disband the third wing and use the aircraft to replace the Air Force's F-5s. The Air Force would then sell the F-5s reducing its numbers by 72 aircraft--a practical step during a period of declining budgets.[65] The role of the aggressor squadrons and their simulation of enemy tactics is an important one, since all USAF fighter pilots train against them at one time or another. Again, a better aircraft in this role could help challenge US pilots even more.

During Severe Budget Cuts: Minimize Costs First, Maximize Capability Second. This is not a markedly different recommendation. However, if even harsher budget cuts force further reductions in tactical aircraft, the second wing should be deactivated and the F-16s should replace older guard and reserve aircraft instead of being added to existing squadrons. This step would save the Air Force an additional $155 million/year--but at a cost of (1) fewer planes and people to accomplish the same missions and (2) very long regeneration times if a worldwide crisis demanded that the Air Force return to its

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[65] 62 F-5s sold and 10 reserve F-4s or A-7s are put into storage.

pre-CFE levels.

Summary of Costs and Savings (in millions of FY 90 $/yr)[66]

	COST	SAVINGS
1. Maximize Cap., Minimize Costs		
Cost to keep each wing in Europe	245	0
1st wing goes to Nellis	235	10
2nd wing enhances reserve #'s	186	59
3rd wing replaces the F-5s	51	194
total savings		263
2. Minimize Costs, Maximize Cap		
1st wing goes to Nellis	235	10
2nd wing replaces F-4s or A-7s	30	215
3rd wing replaces the F-5s	51	194
total savings		419

Addressing NATO's Concerns: Any of the steps recommended remove aircraft that clearly were committed to NATO in time of war. The Air Force must make an effort to show NATO that aircraft sent back to the United States are retaining there NATO mission. Some of the cost savings might be invested in more frequent training deployments to Europe--helping ease the fears of US allies that American tactical aircraft won't be ready to fight in Europe if they're needed. Also, as recommended before, certain Guard or Reserve squadrons (or the new Nellis wing) might be given a Europe-only mission.

Focusing on the Redeployment Problem: The Air Force may

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[66] The second wing comes out of Ramstein, as was assumed earlier. The savings and cost figures include no bare base support costs in this case.

find itself in a fortunate situation, if CFE comes to a conclusion similar to what this paper has predicted and it finds that the money it saves hasn't been eaten up entirely by budget cuts. Where should this money go? One important area glossed over in this study is the increased reliance a CFE tactical aircraft agreement would place on the Air Force airlift capacity. The mobilization constraint assumption is helpful when trying to isolate the basing problem. However, the political atmosphere surrounding a crisis might cause NATO leaders to delay calls for redeployments from the United States--as a gesture of goodwill towards the Warsaw Pact. Increasing US airlift capacity might help to minimize the negative effects of such procrastination. Also, procuring additional transports and tankers would show European allies that the United States will honor its wartime commitments.[67]

Conclusions

It seems, then, that the Air Force can accomodate in a relatively painless way the removal of three F-16 wings from Europe. Though its overall capabilities are diminished, a successful CFE agreement may make such a reduction worthwhile. Also, the money saved by bringing aircraft back to the United States can be used to enhance training and airlift, making the

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[67] Extra funds could also be placed towards squadron training budgets, letting units deploy more frequently to Europe for area familiarization training. Still, this argument will become less valid as developments in simulator technology will allow pilots to fly in Europe as they sit in the United States.

adverse effects even less noticable.

To end, however, it would be misleading not to emphasize again the great number of assumptions upon which this study is based. It is intended to be a first cut at thinking about the problem of moving aircraft back to the United States in the context of conventional arms control. The aircraft may change. The numbers may increase or decrease. This writer hopes, however, that the thought process followed in this paper may be helpful for those who must decide if it is indeed beneficial to include tactical aircraft in the larger scope of a conventional arms agreement.

APPENDIX A

PART I. SUMMARY OF COSTS FOR VARIOUS OPTIONS [All costs in FY 90 dollars]

BASELINE: F-16 Wing(s) in European location

1.	Moving Costs[1]	$0/yr
2.	New Construction[2]	$0/yr
3.	Operating & Maintenance	$244,524,763/yr
	TOTAL	$244,524,763/yr

[see next page for options]

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[1] There are yearly costs in this category, but in this paper they are assumed to be zero.

[2] Same explanation as above.

APPENDIX A
(cost summary cont.)

OPTION 1: Move the F-16 Wings(s) Back to the United States

	Nellis, AFB	Alaska
1. Moving Costs[3]		
Equipment	$3,518,564/yr	$4,691,419/yr
Personnel	$13,000,064/yr	$13,000,064/yr
2. New Construction[4]	$0/yr	
Elmendorf		$41,027,063/yr
Eielson		$46,693,784/yr
3. Oper & Maint		
From Ramstein[5]	$196,788,678/yr	$255,867,333/yr
Other Wings	$218,188,678/yr	$259,316,833/yr
TOTALS		
From Ramstein	$213,307,306/yr	
Other Wings	$234,707,306/yr	
Elmendorf		
From Ramstein		$314,585,879/yr
Other Wings		$335,985,879/yr
Eielson		
From Ramstein		$323,702,100/yr
Other Wings		$345,102,100/yr

[3] These costs are amortized over a 5-year time period using a 10% discount rate.

[4] These costs are amortized over a 30-year time period using a 10% discount rate.

[5] No bare base support costs for Ramstein, since this base would remain open once the F-16 wing left.

APPENDIX A
(cost summary cont.)

OPTION 2: Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve

1.	Moving Costs	
	Equipment	$3,049,422/yr
	Personnel	$13,000,064/yr
2.	New Construction	$0/yr
3.	Operating & Maintenance	
	From Ramstein	$169,849,500/yr
	Other Wings	$191,249,500/yr
TOTAL		
	From Ramstein	$185,898,986/yr
	Other Wings	$207,298,986/yr

OPTION 3: Disband the F-16 Wing(s) and use the Aircraft as Replacements

1.	Moving Costs	
	Equipment	$3,049,422/yr
	Personnel	$13,000,064/yr
2.	New Construction	$0/yr
3.	Operating & Maintenance	
	From Ramstein	$13,849,500/yr
	Other Wings	$35,249,500/yr
TOTAL		
	From Ramstein	$29,898,986/yr
	Other Wings	$51,298,986/yr

APPENDIX A
(cost summary cont.)

OPTION 4: Destroy F-16s[6]

1. Moving Costs	
Equipment	$3,518,564/yr
Personnel	$13,000,064/yr
2. New Construction	$0/yr
3. Operating & Maintenance	
From Ramstein	$0/yr
Other Wings	$21,400,000/yr
TOTAL	
From Ramstein	$16,518,564/yr
Other Wings	$37,918,628/yr

[6] These costs are amortized over 5 yrs at a discount rate of 10%. They would disappear after that amount of time.

APPENDIX A

PART II. BREAKDOWN OF VARIOUS COSTS SHOWN IN THE SUMMARY

A. MOVING COSTS

1. Equipment[7,8]

Aircraft Ferry Cost/Mile	$ 425
Equipment & Supplies Trans Cost/Mile	$ 316
	$ 741/mile/sq

Move 1 wing (72 Aircraft=3 squadrons)
3 * $741 = $2,223/mile/wing[9]

a) Moving Costs To Various Locations (from West Germany):

- Nellis AFB, Nevada	$2223*6000 mi	= $13,338,000
- Elmendorf AFB, Alaska	$2223*8000 mi	= $17,784,000
- Davis-Month. AFB, Ariz	$2223*6000 mi	= $13,338,000
- Aircraft Dispersal[10]	$2223*5200 mi	= $11,559,600

b) Moving Costs To Various Locations (Amortized)

- Nellis AFB,Nevada	(13,338,000*.2638)=$3,518,564/yr
- Elmendorf,Alaska	(17,784,000*.2638)=$4,691,419/yr
- Davis-Mon AFB, AZ	(13,338,000*.2638)=$3,518,564/yr
- Aircraft Dispersal	(11,559,600*.2638)=$3,049,422/yr

---

[7] Aircraft and basic maintenance equipment are the only items considered in this category. Other costs, such as moving trucks, ammunition,..., are not calculated, since it is assumed that these are left in Europe.

[8] Cost figures are from AFR 173-13 and are adjusted for inflation when necessary. Deployment costs per squadron are for 24 PAA (primary aircraft authorized).

[9] This figure does not include the moving costs for non-squadron items such as office furniture used for wing-level offices.

[10] Assume equal distribution to east and west coast bases.

APPENDIX A
(moving costs cont.)

2. Personnel

Military Personnel in F-16 Wing = 3500
PCS cost[11] = $19,000/family
= $6,700/single

a) Assume 60% are married, 40% single

(family) 2100*$19,000 = $39,900,000
(single) 1400*$6,700 = $9,380,000

TOTAL = $49,280,000

b) Amortized costs (over five years at 10%)

(49,280,000*.2638)= $13,000,064/yr

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[11] Katherine Watkins Webb, Telephone Interview. This figure is approximate and does not differentiate between east or west coast CONUS bases.

APPENDIX A

B. NEW CONSTRUCTION

for the state of Alaska
(in FY 90 dollars)[12]

FACILITY	SIZE(SF)	COST/SF	TOTAL COST
Comms bldgs	(Assume present capacity is sufficient)		
Land Op bldg			
squadron (3)	36,000	98	3,528,000
headqtrs (1)	11,000	112	1,232,000
Training bldg	22,624	87	1,968,288
AC Maint (hangar)[13]	87,570	88	7,706,160
Guided Mis Maint	5,460	93	507,780
Tank/Car Maint	(Assume present capacity is sufficient)		
Weapons Maint	3,800	93	353,400
Ammo Maint	4,000	93	372,000
Elec/Coms Maint	16,380	82	1,343,160
Misc Mnt/Proc/Rep	(Assume present capacity is sufficient)		
Fuel (BL)	77,000(BL)	21	1,617,000
Ammo Stor	28,000	122	3,416,000
Cold Stor(CF)	49,373	74	3,653,602
Covered Stor	228,640	48	10,974,720
Open Stor	1,290	22	28,380
Fire Station	8,000	113	904,000
		SUBTOTAL	$37,604,490

[12] SOURCE: AF Annual Construction Pricing Guide for FY 90 Program (April 1988) and Katherine Watkins Webb, "Are Overseas Bases Worth The Bucks? An Approach To Assessing Operational Value And An Application To the Philippines," Diss. Rand Graduate School, p. 147. Also, Telephone Interview with Katherine Webb. Certain figures have been adjusted to levels appropriate for a base in the United States which isn't responsible for stocking wartime supplies or supporting additional wartime units.

Assume that the same facilities would be needed at either base.

[13] The TAC standards from AFR 86-2 are: 1)clear door open=106 ft 2) depth=90 ft 3) # of spaces=.27*PAA 4) minimum wingtip clearance=10 ft between aircraft and wall or another aircraft 5) wingspan of F-16=33 ft; length of F-16=47.6 ft

APPENDIX A
(new construction costs cont.)

HOUSING[14]	Unit	Cost/unit		
Family	2,100	66,300		139,230,000
BOQ	420	45,850		19,257,000
BEQ	980	17,500		17,150,000
			SUBTOTAL	$175,637,000

PERSONNEL SUPPORT (Assume present capacity is sufficient)

TOTAL $213,241,490

GRAND TOTAL = (TOTAL * AREA COST FACTOR[15])

EIELSON Area Cost Factor = 2.06
ELMENDORF Area Cost Factor = 1.81

EIELSON AFB, ALASKA = ($213,637,000*2.06) = $440,092,220
ELMENDORF AFB, ALASKA = ($213,637,000*1.81) = $386,682,970

EIELSON (Amortized) (440,092,220*.1061)= $46,693,784/yr
ELMENDORF (Amortized) (386,682,970*.1061)= $41,027,063/yr

---

[14] Assume 60% of the military personnel have families with them and 40% are single (3500 * .60 = 2100 family units needed, 3500 * .40 = 1400 single units needed). Also, assume 70% of single military members are enlisted and 30% officer (1400 * .70 = 980 BEQ needed and 1400 * .30 = 420 BOQ needed).

[15] From AF Annual Construction Pricing Guide for FY 90 Program.

APPENDIX A

C. OPERATING AND MAINTENANCE COSTS:

SUMMARY OF MAINTENANCE COSTS FOR EACH OPTION

OVERVIEW: [the various categories of costs which are included are shown inside [] for each option: (1) wing non-squadron personnel pay costs + (2) squadron O&M costs + (3) WRSK costs + (4) base costs, all in FY 90 dollars][16]

Baseline: F-16 Wing(s) in present European Location
[1+2].....$244,524,763/yr

Option 1: Move the F-16 Wing(s) Back to the United States

-Nellis AFB, Nevada [1+2+3+4]..$218,188,678/yr

-Alaska [1+2+3][17]..$255,867,333/yr
[1+2+3+4]..$277,267,333/yr

Option 2: Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve[18]

[2+3].....$169,849,500/yr
[2+3+4]....$191,249,500/yr

Option 3: Disband the F-16 Wing(s) and use the Aircraft as Replacements[19]

[3].....$13,849,500/yr
[3+4].....$35,249,500/yr

---

[16] 1 wing = 3 squadrons of 24 PAA

[17] Bare base costs aren't included, since aircraft are coming from Ramstein. This base will still remain open, because of other peacetime missions.

[18] The first amount is for a wing taken out of Ramstein, the second is for any others (which would incur bare base costs).

[19] Cost figures apply for replacing 72 F-5s, F-4s, or A-7s. Again, the first amount applies to a Ramstein wing, the second to the other wings.

APPENDIX A
(O&M cost summary cont.)

Option 4: Destroy F-16s[20]

.....0/yr
[4].....$21,400,000/yr

[20] $0/yr applies only to Ramstein.

APPENDIX A
(O&M costs cont.)

1. Summary of Wing Non-Squadron Personnel Pay Costs:[21]

	# of personnel	cost/person[22]	total
Europe (983)			
Officer	65	67,043	$4,357,795
Enlisted	873	29,701	$25,928,973
Civilian	45	27,511	$1,237,995
		TOTAL	$31,524,763/yr
Nellis AFB (1370)			
Officer	100	61,219	$6,121,900
Enlisted	1222	27,191	$33,227,402
Civilian	48	29,987	$1,439,376
		TOTAL	$40,788,678/yr
Alaska (983)			
Officer	65	67,043	$4,357,795
Enlisted	873	29,701	$25,928,973
Civilian	45	48,457	$2,180,565
		TOTAL	$32,467,333/yr

[21] Assume 3500 total wing staffing (squadron + wing personnel). SABLE model provides the number of squadron personnel only.

[22] The cost/person was determined by using the SABLE model inputs. SABLE model only provided Alaskan Air Command cost/person for F-15 wing so these figures were used instead.

(O&M costs cont.)

2. Summary of Squadron O & M costs (from SABLE Model)[23]

Baseline: F-16 Wing(s) in present European location
$213,000,000/yr

Option 1: Move the F-16 Wing(s) Back to the United States

-Nellis AFB, Nevada $156,000,000/yr
-Alaska[24] $213,000,000/yr

Option 2: Disband the F-16 Wing(s) and use the Aircraft to Bolster the Strength of the Guard or Reserve[25]

$156,000,000/yr

Option 3: Disband the F-16 Wing(s) and use the Aircraft as Replacements[26]

$0/yr

Option 4: Destroy F-16s $0/yr

APPENDIX A

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[23] See attached SABLE model explanation for costs that are included.

[24] No cost information exists for F-16s in Alaska. Looking at the previous section on Wing non-squadron personnel costs, the pay rates are the same or higher than in Europe. I use the European cost data, then, as a better approximation than US cost data.

[25] Assumes that Reserve costs are the same as Regular Air Force costs--thus this estimate may be high.

[26] Costs are $0/yr, since the F-16s are replacing other aircraft--current Guard or Reserve budget levels are assumed sufficient to support these newer aircraft. The other aircraft are then removed from the inventory.

(O&M costs cont.)

3. Summary of War Reserve Spare Kit (WRSK) Costs[27]

per squadron	$4,616,500/yr
per wing	$13,849,500/yr

4. Summary of Bare Base Costs[28]

per bare base	$21,400,000/yr

---

[27] 17.5 million/squadron amortized over 5 yrs at a 10% discount rate. This is only an estimate since each squadron has a different role with differing WRSK requirements.

[28] Applies to Hahn and Torrejon. No unclassified information existed for estimating. As a proxy, I took 1/2 of a squadron's annual [Personnel + Installation Support + Medical(nonpay)] costs. This equals the money necessary to employ roughly 400 military personnel as security police and maintenance personnel, who would be responsible for keeping the base open for training. This duty would be unaccompanied or families would have to be housed at nearby military installations, as schools, BXs,... would be closed.

APPENDIX B (1)

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*****************************************************************
*                          SABLE MODEL                          *
*                                                               *
*   REPORT   =  COST SUMMARY          M/D/S    = F016C          *
*   DOLLARS  =  TY DOLLARS            MAJCOM   = AFE            *
*   VERSION  =  89-1                  DATE     = 24 MAR 89      *
*****************************************************************
```

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
	****	****	****	****	****	****	****	****
PAA QTY	24	24	24	24	24	24	24	24
FLYING HOURS	9528	9528	9528	9528	9528	9528	9528	9528
CREW RATIO	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
UNIT OFFICERS	0	0	0	0	0	0	0	0
UNIT ENLISTED	0	0	0	0	0	0	0	0
CIVILIANS	39	39	39	39	39	39	39	39
ACTIVE OFFICERS	55	55	55	55	55	55	55	55
ACTIVE ENLISTED	745	745	745	745	745	745	745	745
PROCUREMENT COSTS								
CLASS IV MODS	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
SPARES SUP EQUIP	1.05	1.27	1.30	1.33	1.35	1.38	1.41	1.45
REPLEN SPARES	10.01	10.27	10.05	10.29	10.51	10.81	11.02	11.21
TOTAL 3010	12.4	13.0	12.7	13.0	13.3	13.7	13.9	14.2
[illegible]								
[illegible]	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
TOTAL [illegible]	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
O & M COSTS								
FUEL	4.2	4.4	4.7	4.9	5.2	5.4	5.7	6.0
CONSUMABLE SUPPLIES	2.65	2.77	2.86	2.93	2.99	3.05	3.10	3.16
DEPOT MAINTENANCE	5.93	6.04	6.22	6.38	6.51	6.62	6.74	6.87
CLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIVILIAN PAY	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
[illegible] NON-PAY	6.4	6.6	6.8	7.0	7.1	7.2	7.4	7.5
MEDICAL NON-PAY	0.31	0.33	0.34	0.34	0.35	0.36	0.36	0.37
TOTAL O&M	21.2	21.2	22.0	22.7	23.3	23.9	24.5	25.1
MILITARY COMPENSATION								
[illegible] PAY	25.3	26.7	27.6	28.4	29.2	[illegible]	30.9	31.8
ACQUISITION TRAINING	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7
PCS	2.6	2.7	2.8	2.9	2.9	3.0	3.1	3.2
TOT MIL COMP	34.7	[illegible]	37.1	38.2	39.3	40.4	41.6	42.7
TOTAL COST	69.1	71.0	72.7	74.6	76.8	78.9	80.9	83.0

SABLE MODEL

REPORT =	COST FACTORS	M/D/S =	F016C
DOLLARS =	FY89 DOLLARS	MAJCOM =	AFE
VERSION =	89-1	DATE =	24 MAR 89

[illegible]	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
[illegible]	24	24	24	24	24	24	24	24
[illegible]	9528	9528	9528	9528	9528	9528	9528	9528
CREW RATIO	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34

[illegible]

DRILL OFFICERS	0	0	0	0	0	0	0	0
DRILL ENLISTED	0	0	0	0	0	0	0	0
CIVILIANS	39	39	39	39	39	39	39	39
ACTIVE OFFICERS	55	55	55	55	55	55	55	55
ACTIVE ENLISTED	745	745	745	745	745	745	745	745

LOGISTICS FACTORS

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	142	142	142	142	142	142	142	142
[illegible]	105	105	105	105	105	105	105	105
[illegible]	[illegible]	949	945	948	950	961	961	961
[illegible]	39757	46710	46710	46710	46710	46710	46710	46710
DEPOT MAINT/FH	498	487	487	487	487	487	487	487
DEPOT MAINT/PAA	49394	46853	46853	46853	46853	46853	46853	46853
[illegible]	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0

INFLATION FACTORS	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
[illegible]	1.058	1.087	1.116	1.139	1.161	1.181	1.203	1.224
[illegible]	1.057	1.088	1.113	1.139	1.160	1.181	1.202	1.224
[illegible]	1.015	1.050	1.083	1.111	1.134	1.155	1.175	1.197
[illegible]	1.000	1.047	1.079	1.106	1.129	1.149	1.170	1.191
FUEL COST/GALLON	0.610	0.530	0.580	0.614	0.647	0.678	0.711	0.746
MILITARY PAY & ALW	1.000	1.036	1.070	1.101	1.133	1.165	1.193	1.222
CIVILIAN PAY	1.000	1.027	1.054	1.084	1.111	1.133	1.153	1.174

[illegible]

PILOT TRAINING	1777448	PILOTS/CREW	1
RATED OFFICER TRAINING	0	OTH OFFICERS/CREW	0
RATED ENLISTED TRAINING	0	ENLISTED/CREW	0
NONRATED OFFICER TRAINING	15793	MUNITIONS/CREW	23661
NONRATED ENLISTED TNG	8994	FLYAWAY COST	13.7
NONRATED OFFICER TURNOVER	0.07	BOS NON-PAY	7459
ENLISTED TURNOVER	0.11	MED NON-PAY	357
PILOT TURNOVER	0.05	OFFICER ACQUISITION	70643
RATED OFFICER TURN-O	0.06	ENLISTED ACQUISITION	7783
DRILL OFFICER PAY	0	OFFICER PCS	6714
DRILL ENLISTED PAY	0	ENLISTED PCS	2989
CIVILIAN PAY	27511		
ACTIVE OFFICER PAY	67043		
ACTIVE ENLISTED PAY	29701		

APPENDIX B (3)

SABLE MODEL

REPORT = COST FACTORS	M/D/S = F016C
DOLLARS = FY89 DOLLARS	MAJCOM = TAC
VERSION = 89-1	DATE = 24 MAR 89

[illegible]	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
[illegible]	24	24	24	24	24	24	24	24
[illegible]	6084	6084	6084	6084	6084	6084	6084	6084
[illegible]	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74

[illegible]								
[illegible]	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0
[illegible]	25	25	25	25	25	25	25	25
[illegible]	52	52	52	52	52	52	52	52
[illegible]	603	603	603	603	603	603	603	603

[illegible]								
[illegible]	841	840	840	841	840	840	841	840
[illegible]	141	142	142	142	142	142	142	141
[illegible]	105	105	105	105	105	105	105	105
[illegible]	943	949	942	942	950	951	951	951
[illegible]	39757	46710	46710	46710	46710	46710	46710	46710
[illegible]	478	487	487	487	487	487	487	487
[illegible]	49794	46853	46853	46853	46853	46853	46853	46853
[illegible]	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0

[illegible]	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
[illegible]	1.058	1.087	1.116	1.139	1.161	1.181	1.202	1.224
[illegible]	1.057	1.088	1.115	1.139	1.160	1.181	1.202	1.224
[illegible]	1.015	1.050	1.085	1.111	1.174	1.155	1.175	1.197
[illegible]	1.000	1.047	1.079	1.106	1.129	1.149	1.170	1.191
[illegible]	0.[illegible]	0.550	0.580	0.614	0.647	0.678	0.711	0.745
[illegible]	1.[illegible]	1.036	1.070	1.101	1.131	1.155	1.198	1.222
[illegible]	1.000	1.027	1.054	1.084	1.111	1.133	1.153	1.174

[illegible]

[illegible]	177448	PILOTS/CREW	1
[illegible]	0	OTH OFFICERS/CREW	0
[illegible]	0	ENLISTED/CREW	0
[illegible]	15793	MUNITIONS/CREW	23651
[illegible]	8994	FLYAWAY COST (M-$)	13.7
[illegible]	0.[illegible]	BOS NON-PAY	4752
[illegible]	0.11	MED NON-PAY	367
[illegible]	0.[illegible]	OFFICER ACQUISITION	70943
[illegible]	0.15	ENLISTED ACQUISITION	7783
[illegible] OFFICER PAY	0	OFFICER PCS	1388
[illegible] ENLISTED PAY	0	ENLISTED PCS	767
CIVILIAN PAY	27987		
ACTIVE OFFICER PAY	61219		
ACTIVE ENLISTED PAY	27191		

APPENDIX B (4)

```
*************************************************************
*                    SABLE MODEL                            *
*                                                           *
*  REPORT  =  COST SUMMARY          M/D/S   = F016C         *
*  DOLLARS =  TY DOLLARS            MAJCOM  = TAC           *
*  VERSION =  89-1                  DATE    = 24 MAR 89     *
*************************************************************
```

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
	****	****	****	****	****	****	****	****
PAA QTY	24	24	24	24	24	24	24	24
FLYING HOURS	6384	6384	6384	6384	6384	6384	6384	6384
CREW RATIO	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24
[illegible] OFFICERS	[illegible]	0	0	0	0	0	0	0
[illegible] ENLISTED	0	0	0	0	0	0	0	0
CIVILIANS	25	25	25	25	25	25	25	25
[illegible] OFFICERS	52	52	52	52	52	52	52	52
[illegible] ENLISTED	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
REPLACEMENT [illegible]								
*********************								
[illegible]	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
[illegible]	1.02	1.22	[illegible]	[illegible]	1.36	[illegible]	1.41	1.42
[illegible] SPARES	6.71	6.73	6.71	6.87	7.04	7.25	7.38	7.51
TOTAL [illegible]	9.1	9.6	9.4	9.6	9.8	10.1	10.3	10.5
PROCUREMENT OTHER								
***************************								
TRAINING MUNITIONS	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
TOTAL [illegible]	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
[illegible]								
**********************								
FUEL	3.0	3.0	3.1	3.3	3.5	3.6	3.8	4.0
CONSUMABLE SUPPLIES	1.79	1.85	1.92	1.96	2.01	2.04	2.08	2.12
DEPOT MAINTENANCE	4.36	4.45	4.57	4.68	4.78	4.86	4.95	5.04
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIVILIAN PAY	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9
[illegible]	3.4	3.5	3.7	3.7	3.8	3.9	4.0	4.0
MEDICAL [illegible]	0.27	0.28	0.29	0.29	0.30	0.31	0.31	0.32
TOTAL O&M	13.9	13.3	14.3	14.6	15.2	15.6	16.0	16.4
MILITARY COMPENSATION								
*************************								
MILITARY PAY	20.4	[illegible]	21.1	22.2	23.1	23.8	24.4	25.1
[illegible]	6.1	6.1	6.2	6.7	6.9	7.2	7.3	7.5
PCS	0.3	[illegible]	0.3	0.3	0.4	0.4	0.4	0.4
TOT MIL COMP	26.9	27.7	28.6	29.5	30.3	31.2	32.1	33.0
TOTAL COST	50.5	52.0	53.3	54.8	56.3	57.8	59.3	60.8

APPENDIX B (5)

CHAPTER 1

OPERATING AND SUPPORT (O&S) COST TERMINOLOGY/DEFINITIONS

1-1. Force and Financial Plan (F&FP) data base. The F&FP data base, managed by the Secretary of the Air Force, Deputy Comptroller, Budget (SAF/ACB), is the official data base on the Planning, Programming, Budget System (PPBS). It is the data base that records the Air Force portion of the Office of the Secretary of Defense (OSD) Five Year Defense Plan (FYDP). At the conclusion of the Program Objective Memorandum (POM), Budget Estimate Submission (BES), and the President's Budget (PB), SAF/ACB converts the F&FP data to a format compatible with the OSD FYDP update.

a. At the beginning of the POM, the PB, as presented in the F&FP data base, is the exercise baseline. Changes to the F&FP data base baseline are made through Air Staff budget/POM exercises. The F&FP system contains a change file where deltas to the baseline are accumulated. SAF/ACB budget analysts enter the F&FP data base revisions based upon Air Staff Board (ASB) guidance and coordination with appropriate Air Staff directorates.

b. The F&FP mechanized system contains four active cost models used by SAF/ACB during exercises: 1) Procurement model (3010), 2) O&M model (3400), 3) Civilian manpower model, and 4) Military manpower model. These models contain program and/or cost factor files that automatically calculate much of the logistics and all manpower costs for the active Air Force budget. The Procurement model also calculates investment costs for Reserve forces, but other Reserve force costs are not part of the F&FP mechanized system.

1-2. Program Decision Packages (PDPs) and the PDP data base. The Director of Programs and Evaluation (AF/PRP), as Chairman of the Air Staff Board (ASB), is responsible for building the POM. The PDP data base is the system that the Air Force Board Structure (panels, Program Review Committee (PRC), and ASB) uses to evaluate programs and track the programs through the PPBS process. Current AF programs plus proposed alternatives are entered in the system by preparing PDPs. A PDP is the basis for developing and costing a specific program.

a. Air Staff package monitors or Program Element Monitors (PEMs) prepare or update PDPs. PDPs are reviewed and accepted by Air Staff panels, approved by the PRC, and then entered in the PDP data base by panel members.

b. Exercises are scheduled at specific times throughout the year to update the F&FP data base and properly price the changes to the baseline programs. To do this, the F&FP baseline data is compared to the PDP data base. Then, exercise guidance is published as to how the F&FP is to be changed or modified to incorporate Air Force Board Structure decisions. At the end of

every exercise, the PDP data base is updated to agree with the F&FP.

1-3. O&S costs and Cost Element Structure (CES). The O&S cost category is one of the major categories in the Life Cycle Cost (LCC) of a weapon system. LCC cost categories include: Acquisition (Research and Development, Procurement, and Construction), O&S, and Disposal.

a. O&S costs include, but are not limited to, cost elements included in the Operations and Maintenance (O&M) appropriation. O&M is a single, annual appropriation which is a statutory authority to incur obligations and to make payments to finance day-to-day operations in the Air Force such as: aviation and ground fuels, civilian pay, travel, transportation, communications, contracts, supplies, equipment, and so forth.

b. O&S costs include O&M expenditures as well as expenditures from numerous other appropriations. For example, O&S includes aircraft replenishment spares costs which are funded from Appropriation 3010-Aircraft Procurement, military personnel costs which are funded from Appropriation 3500-Military Personnel, and training munitions costs which are funded by 3080-Other Procurement Appropriation.

c. O&S costs have an established CES to detail all costs to be included in an estimate. This handbook describes the CES for aircraft systems in the definitions of programming, logistics, and support factors. The CES also corresponds to the cost elements required to be estimated with each appropriation.

1-4. O&S Cost Model (Systematic Approach to Better Long-Range Estimating (SABLE)). The SABLE Cost Model is designed to estimate aircraft peacetime O&S costs for typical Air Force flying units. The program data for the model (squadron size and flying hours per aircraft) are drawn from Air Force programming documents. The logistics costs are derived from the same cost factors used in the F&FP for active Air Force aircraft. The squadron manpower estimates are typical authorized unit strengths (not specific units) while pay rates are taken directly from current F&FP data. The support nonpay costs are estimates derived from Air Force accounting records. The model outputs are distributed throughout the Air Staff when significant changes in program, manpower, pay, or logistics cost factors occur in the F&FP data base.

1-5. Base-Year and Then-Year Dollars. A base-year dollar reflects the dollars value at the time of a specified base year as if all the dollars were expended in that year. A then-year dollar is a constant or base-year dollar that has been either inflated or deflated using the appropriate inflation index to show the amount of money that will be needed when the goods and services expenditures will actually be made. All PPBS documents (including PDPs) use then-year dollars to properly show the Total Obligation Authority (TOA) that must be appropriated during a

specific fiscal year. The SABLE Cost Model uses then-year dollars for yearly cost estimates. (For additional information refer to the USAF Handbook for Program Element Managers on Inflation Policy and Applications, November 1983.)

1-6. Appropriations/Budget Programs/Cost Elements. A fund appropriation is enacted by Congress to authorize the Air Force to fund resources for acquiring, implementing, operating, maintaining, and supporting its mission, functions, and activities. A budget program is a part of an appropriation set up in order to identify a significant segment of Air Force operations. A cost element is a funds category within a budget program and appropriation that identifies a specific item, resource, or service to be purchased.

a. The SABLE Model output identifies the appropriation and budget program nomenclature for the weapon system O&S estimate.

b. AFM 172-1, Volume IV, Appropriation Symbols and Budget Codes identifies current appropriations and codes for personnel who are responsible for developing budget requirements or executing the budget. AFM 172-1, Volume II, USAF Budget Manual Estimating Instructions presents details of how resource requirements for the various appropriations are developed.

1-7. Variable, Fixed, and Semivariable O&S Costs and Cost Factors. A variable O&S cost is a cost that is expected to increase proportionately with an increase in activity and decrease proportionately with a decrease in level of activity. A semivariable cost displays both fixed and variable characteristics. Cost factors, as used by the Air Force in the F&FP data base and in cost estimating models, are standard or expected variable or semivariable costs that are used to estimate resource requirements and costs associated with force structures, missions, and activities. At the beginning of the POM process, logistics, manpower, and support cost factors are developed for that specific POM five year period. Factors are developed on the basis of a cost per person, cost per flying hour, and cost per aircraft. These factors are used in the mechanized budget system to adjust costs when program activity increases/decreases through flying hours, numbers of authorized aircraft, or people.

a. Fixed costs are not included in the logistics and support cost factors. Specifically, the fixed costs of operating a support base, the fixed overhead costs of higher headquarters, and the fixed costs of operating an air logistics center are not included in the cost factors.

b. For certain logistics factors (depot maintenance and replacement support equipment), cost factors represent semivariable costs. For example, a minimum quantity of supplies or services may be needed to maintain readiness to operate a weapon system. Beyond this minimum quantity (and cost) which is fixed, additional cost varies with activity. Cost per aircraft represents the fixed portion, and cost per Flying Hour (FH)

represents the variable portion of these semivariable costs.

1-8. Programming Factors. O&S costs are generated by operational units performing carefully defined missions at specified activity levels.

a. The basic Air Force flying unit is an aircraft squadron. The SABLE Model estimates O&S costs for typical Air Force aircraft squadrons.

b. The crew ratio is the number of aircrews (pilots, navigators, electronic warfare officers, and enlisted personnel authorized as aircrew) authorized for each equipment aircraft. By multiplying the crew ratio by the number of authorized aircraft, the total number of aircrews for a squadron is determined. The SABLE Model aircrew manpower data considers Air Force approved crew ratios for each mission/design/series (M/D/S) and aircraft mission.

c. The peacetime activity level for an Air Force squadron can be measured in flying hours per aircraft per year. The SABLE Model uses specific Air Force programmed FH per aircraft to develop activity levels with which to estimate typical squadron O&S costs.

1-9. Logistics Factors. Logistics factors represent costs per aircraft or FH for the various commodities/services. Some logistics factors justify total budget resource requirements (aviation fuel, consumable maintenance supplies, and replacement ground support equipment). Other logistics factors are developed solely to make marginal cost changes to budgeted amounts in the F&FP data base (depot maintenance and replenishment spares). All factors may be used for marginal cost changes. The SABLE Model applies these logistics cost factors to the programming factors to develop squadron logistics cost estimates.

a. Aviation fuel cost factors for each M/D/S priced at the Air Force Operations and Maintenance (O&M) standard fuel price per gallon for a particular year. The SABLE Model uses the squadron programming factors and the aviation fuel cost factors of the F&FP data base for the squadron estimates for flying fuel. The SABLE Model has unique fuel factors for active and reserve force aircraft which are used in justifying aviation fuel budgets for the various O&M appropriations.

b. Replenishment spares cost factors represent the estimated cost per FH to procure high cost reparable items which are purchased under Budget Program 1500 of Appropriation 3010 (Aircraft Procurement). These items are repaired when damaged, as long as the estimated cost of repair is 65 percent or less than the parts acquisition cost. If these conditions are not met, the items are condemned at either base or depot level. The replenishment spares factor only includes the estimated cost to procure new spares and does not include the cost of repairing the spares. The repair costs for spares is included in the depot

maintenance factors or in base-level maintenance costs. The SABLE Model uses the M/D/S spares cost per FH factors of the F&FP data base to compute squadron costs for replenishment spares. Note - Because of administrative and procurement lead time required for the replenishment spares account, cost factors are developed based upon future (two year) force structure and flying hour programs. Note - Factors apply to active and reserve force aircraft.

c. Consumable supplies cost factors represent the estimated cost per FH for maintenance supplies directly associated with the flying mission (nuts, bolts, small tools, hoses, clamps, brackets, landing light lenses, etc.) that are expended in Air Force Elements of Expense/Investment Code (EEIC) 605 (system support) and 609 (general support). The cost factors do not include base level maintenance labor. The SABLE Model uses the M/D/S supplies cost per FH factors of the F&FP data base to compute squadron costs for systems support and general support items. Squadron labor costs are captured in squadron manpower estimates. Note - Unique factors are included in SABLE estimates for reserve forces.

d. Depot maintenance cost factors represent marginal costs cost per FH and aircraft) for all organic and contract elements of expenditures incurred by the Depot Maintenance Service, Air Force Industrial Fund, to inspect, repair, overhaul, or perform other aircraft maintenance not performed at base level. Cost factors include labor, expense material (not the cost of buying new replenishment spares), and overhead. The factors include the costs for baseline depot maintenance (periodic inspections, repair of components, airframe and engine rework, support equipment repair, and other services performed by the Air Force using government-owned or controlled facilities, equipment, and government personnel or contractors); Interim Contractor Support (ICS); and Contractor Logistics Support (CLS) (when appropriate). The SABLE Model uses the M/D/S cost per FH and aircraft factors of the F&FP data base to compute the squadron's share of depot maintenance costs. Note - Unique factors are included in SABLE estimates for reserve forces.

e. Ground Support Equipment (GSE). The GSE cost factor represents the yearly cost per PAA to replace organizational and intermediate level support aircraft and common support of new aircraft entering the inventory. GSE factors are developed from the Equipment Data Bank (C008 Tape), HQ AFLC; the System Service Life Expectancy (D039 Tape); and the latest planning documents. The SABLE Model uses the M/D/S cost per aircraft of the F&FP data base to compute the squadron's share of the GSE costs. Note - GSE factors apply to active and reserve force aircraft.

f. Contractor Logistics Support (CLS) cost factors represent the estimated cost (cost per FH and aircraft) of providing all, or portions of, organizational, intermediate and depot level logistics actions needed to support a weapon system. It is generally funded with Appropriation 3400, EEIC 585, and is

planned for the operational life of the system.

g. Class IV Modifications (safety of flight and reliability/maintainability). The F&FP data base does not contain cost factors for Class IV modification hardware requirements. The SABLE Model estimates annual or recurring squadron Class IV modification amounts and initial spares for modifications by using a specially developed estimating equation based upon aircraft flyaway costs.

h. Training Munitions. The training munitions cost category represents the estimated annual cost of the authorized peacetime munition allowances used by aircrews assigned to unit training positions. The costs are based on the number of authorized aircrews and the cost for the mix of munitions that are listed in Air Force Regulation 50-21 for each type of aircraft. Training munitions are programmed in Program Element (PE) 27599F (PDP T-300) and procured from Appropriation 3080 funds.

1-10. Personnel Factors. Typical squadron authorized strengths include personnel required to operate and support aircraft squadrons. The SABLE Model uses the typical strengths as a basis to compute personnel costs. The model also uses the pay rates per person from the F&FP data base for calculating personnel costs. In addition, the SABLE Model uses cost per person rates to calculate squadron permanent change of station (PCS) costs.

a. The squadron manpower required to operate and support aircraft squadrons is developed from engineering and statistical standards and manpower planning factors. The Primary Program Element (PPE) and the Base Operating and Support (BOS) manpower for SABLE is provided by AF/PRM. These are "typical", not squadron specific, estimates. Any PDP manpower estimate must be reviewed by the appropriate Air Staff panel manpower representative and by AF/PRM.

(1) Manpower for the squadron includes aircrews, maintenance, munitions and weapon system security, and a portion of the Wing/Base staff.

(2) BOS manpower allocated to the squadron operation includes a standard percentage of real property maintenance, medical, and base operating/support (communications, supply, services, transportation) personnel.

b. Military and civilian composite pay rates are taken directly from current fiscal year rates used in the F&FP data base.

(1) Military pay rates include basic pay; basic allowance for quarters (BAQ); variable housing allowance (VHA); incentive and special pays that include aircrew, hazardous duty, hostile fire, and duty at special locations. It also includes amounts for subsistence, overseas station allowance, family separation allowance, social security tax, separation payments,

death gratuities, reenlistment bonuses, proficiency pay, unemployment compensation, and retirement.

(2) Civilian pay rates include basic pay; additional variable payments for overtime; holiday pay; night differentials; cost-of-living allowances; and government costs for employee benefits such as quarters allowance when paid in cash incentive awards, the employers share of payments of insurance, retirement, Medicare, FICA taxes, and similar payments.

c. PCS costs per person factors are computed by AF/DPPB. These factors include a combination of married and single member moves with total entitlements (shipment of household goods, dislocation allowance, transportation of privately owned vehicles, storage costs, etc.). The factors differentiate between moves within the United States (US) and moves to and from overseas areas. The SABLE Model uses the PCS factors to compute a squadron's share of Air Force PCS costs. Note - Air Force PCS resource estimates are in a separate category of personnel costs (PDP P222, PE 88731F) and are not part of the F&FP mechanized pricing system.

1-11. Installation Support Factors (Nonpay). Support costs include nonpay amounts for real property maintenance (RPM), communications support, and base operating support (BOS). The SABLE Model uses variable costs factors to calculate squadron installation support nonpay costs.

a. RPM (PE xxx94F) is the variable nonpay cost of acquisition, construction, maintenance, and operation of real property facilities. The element includes costs for related management, engineering, and other support work and services. It includes costs for rent, supplies and equipment for the maintenance and repair of real property facilities, supplies or contract costs for additions, expansions, conversions, and other minor construction performed by the base civil engineer. The element also includes the procurement, supply, and related costs of production and distribution of basic utility services (electric, heating, air-conditioning, and water), purchased services, and administrative support for other engineering activities such as fire prevention, snow removal, and crash rescue. The element does not include construction of facilities financed by military construction program funds. Note - If a program may involve additional RPM expenditures, contact AF/LEEPO for information as they develop PDP F-170 and F-171 on RPMA (RPM activities) for active forces or contact the AFCSTC/OS for an estimate of marginal RPM costs.

b. Communication Support (Program Element xxx95F) is the peculiar support equipment, necessary facilities, and the associated marginal costs specifically identified to base telephone systems, nontactical radio systems, wire communication services, intrabase radio systems, and base-level commercial communications requirements. The element does not include costs of AUTOVON, AUTODIN, and leased long line communication services,

or pay. Major commands budget and fund for this cost category.

c. BOS (PE xxx96F) is the variable nonpay cost of support equipment, facilities, associated nonpay variable costs specifically identified to base level support functions for fixed installations and assigned mission units. This includes costs for supply, travel, automatic data processing support (nonfunctional), rent and other costs associated with comptroller, consolidated base personnel office, audiovisual services, social actions, judge advocate, command section (not MAJCOM headquarters), fuels management, and other base support functions. The element also includes costs for Army and AF Exchange Service as allowed in AFR 172-1, Volume 1, and commissary administration and management activities. Major commands program and execute BOS O&M expenditures. BOS requirements are included in numerous PDPs, depending on the aircraft system and major command; however, all costs should be identified with PE xxx96F.

d. The F&FP data base does not have a mechanized process with which to vary support costs when personnel or activity levels change. The F&FP data base does include discreet amounts for BOS, RPM, and communications support.

1-12. Acquisition, Training, Turnover, and Medical nonpay factors. These factors measure additional recurring costs that are associated with or caused by the normal operation of an aircraft squadron. Acquisition, training and medical costs are included in Major Force Program 8.

a. Cost per person rates are developed for personnel acquisition. Acquisition of personnel is the cost to acquire officer and enlisted personnel. The officer factor represents the costs for graduates of the Air Force Academy, Air Force Reserve Officer Training Corp (ROTC), Officer Training School (OTS), and the Airmen Education and Commissioning Program (AECP). Enlisted costs represent the costs for graduates from Basic Military Training (BMT). Each factor is a composite of the average cost of recruiting, accession travel (one way cost to an initial training base or civilian instruction), temporary duty (TDY) (per diem paid to trainees enrolled in courses of less than twenty weeks duration), initial clothing, education and training, and miscellaneous allowances. Costs do not include training to attain an Air Force Specialty Code (AFSC).

b. Cost per person rates are developed for categories of individual training. Individual training is the cost of undergraduate pilot training (UPT), nonpilot aircrew training, and nonaircrew officer and enlisted specialty training (formal training courses). Factors include costs for military and civilian pay (instructors and students), PCS, and supplies. For flying training courses, the factors include costs for aviation fuel, depot maintenance, and replenishment spares. Cost of Combat Crew Training Squadrons (CCTS) is not included.

c. Personnel Turnover Rates. These factors provide projected Air Force turnover for the pilots (Lt Col and below), nonpilot rated personnel, nonrated officers, and enlisted personnel. AF/DPPP develops the rates using econometric modeling methods which measure pay; benefits, civilian unemployment, airline hiring (for pilots), and inflation. The turnover rates multiplied by the squadron manpower results in estimated replacements required annually for a squadron.

d. Medical nonpay is the variable cost of miscellaneous medical supply support for all personnel. Health care costs are programmed by AF/SGHC in PE 877xxF and are included in separate PDPs.

1-13. Cost per FH. A squadron aircraft cost per FH can be calculated in two ways.

a. The true variable cost per FH for an aircraft is calculated by totaling the logistics cost per FH factors (aviation fuel, replenishment spares, consumable supplies, and the FH portion of depot maintenance).

b. The total cost per FH is calculated by dividing total squadron operating costs by the total squadron flying hours. This is not considered a true variable cost per FH because squadron manpower and other costs are relatively fixed and do not vary directly to a change in flying hours. This calculation should not be made to develop resource requirements at different levels of flying hour activity. The total cost per FH is only valid at the specified level at which the calculation was made.

1-14. Cost Factors Report/Cost Summary Report. The SABLE Model output consists of 1) a file that details the specific cost factors used to develop the typical squadron O&S cost estimates and 2) the cost summary report which shows, by appropriation and budget program nomenclature, the typical O&S costs of the flying unit.

1-15. Cost Categories not estimated in the SABLE Model.

a. Software Maintenance/Support is the cost of maintaining system software for aircraft, support equipment, and training equipment. Software requirements are included in PE 71112F, Inventory Control Point Operations, and included in PDP S241, managed by AF/LEXM.

b. Depot Nonmaintenance is the cost of personnel and materiel involved in nonmaintenance functions at depot level. This cost category includes both organic and contract costs and is broken down into two subcategories: general depot support and second destination transportation.

(1) General Depot Support is the cost of personnel and materiel supporting the depot level functions of supply, inventory control point, procurement, logistics support, and

maintenance support. Depot support is broken down further as the cost of personnel and materiel needed to manage the procurement of supplies, spares, and repair parts and maintain control and accountability of these assets. It includes the cost of personnel and materiel needed to fill requisitions for supplies (receiving, unpacking, storage, packing, crating, etc.). It also includes the cost of depot level sustaining or service engineering and the cost of maintaining, updating, publishing, and distributing publications and technical orders for operating a weapon system. General Depot Support costs are included in PDPs S-241, Inventory Control Point Ops (PE 71112F), and S-272, Supply Depot Operations (PE 71112F), which are managed by AF/LEXM.

(2) Second Destination Transportation (SDT) is the round-trip cost of transporting engines and engine components, ground support equipment, and reparable items to depot maintenance facilities and back to operational units or stock points. It also includes the one-way cost of transporting repair parts from stock points to depot and below depot maintenance activities. SDT requirements are included in PDP S-248 and monitored by AF/LETX. AFLC/DSXR is the office of primary responsibility for developing and submitting the SDT requirements to the Air Staff.

c. Military Construction is the cost of acquiring, constructing, installing, and equipping temporary or permanent public works, military installations, and facilities for the regular Air Force; the cost of acquiring, constructing, expanding, rehabilitating, and converting facilities for the training and administration of the Air Force Reserve and Air National Guard; and the cost of the Air Force housing construction program.

d. Family Housing (O&M) is the cost of leasing of housing facilities; reimbursement to other US agencies for family dwelling units; initial outfitting, maintenance, repair, and replacement of appliances and furnishings; utilities and other services; administrative and support services at installation-level housing facilities; transportation, supplies and materials; maintenance and repair of buildings, utility systems, and grounds; maintenance, repair, and replacement of integral components or movable items of a housing unit; alterations and additions at a cost less than $2,000 per unit and $200,000 per project; and also includes the debt-payment program.

Interviews

JFK SCHOOL OF GOVERNMENT

Ambassador Robert Blackwill
Schuyler Foerster (Lt. Col, USAF)
Robert Murray
Micheal O'Hare
Samuel Westbrook (B-Gen, USAF)

PENTAGON

Air Force:
- Colonel Ron Echelman
- Major Doug Richardson
- Major Dave Flemming
- Lt. Col Heffernan
- Lt. Col Steve Sharkey
- Major Stratton

Air Force Cost Center:
- Captain Rodney Troyanowski
- Scott Dillon

PA&E:
- Jim Madora
- Katherine Webb

JCS:
- Colonel Paul Harbison

VARIOUS AF PERSONNEL AT

Davis Monthan AFB
Elmendorf AFB
England AFB
Luke AFB
Nellis AFB
Ramstein AB
Shaw AFB
Shaw AFB
Ramstein AFB
Nellis AFB
Elmendorf AFB

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